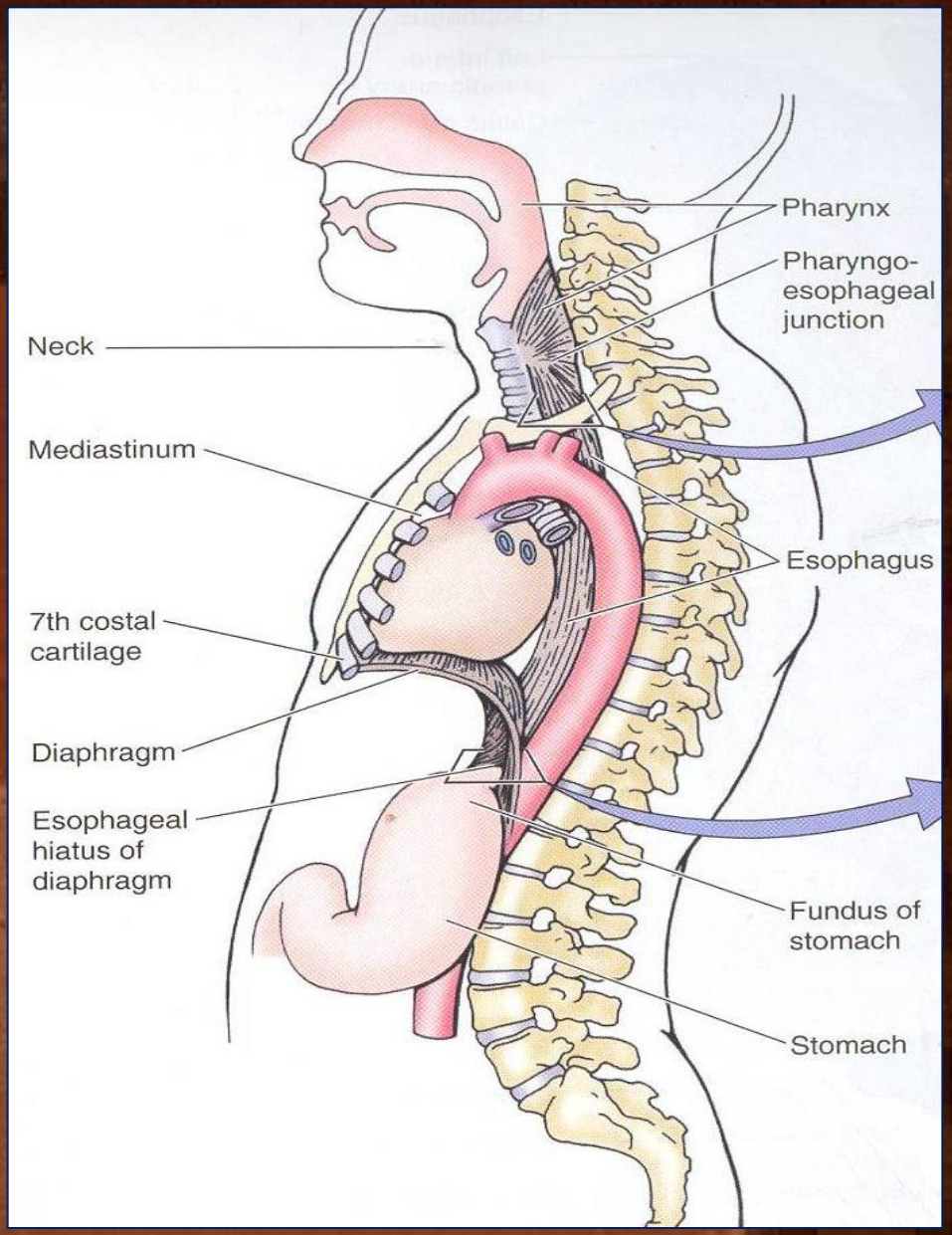
ORAL CAVITY, ESOPHAGUS AND STOMACH

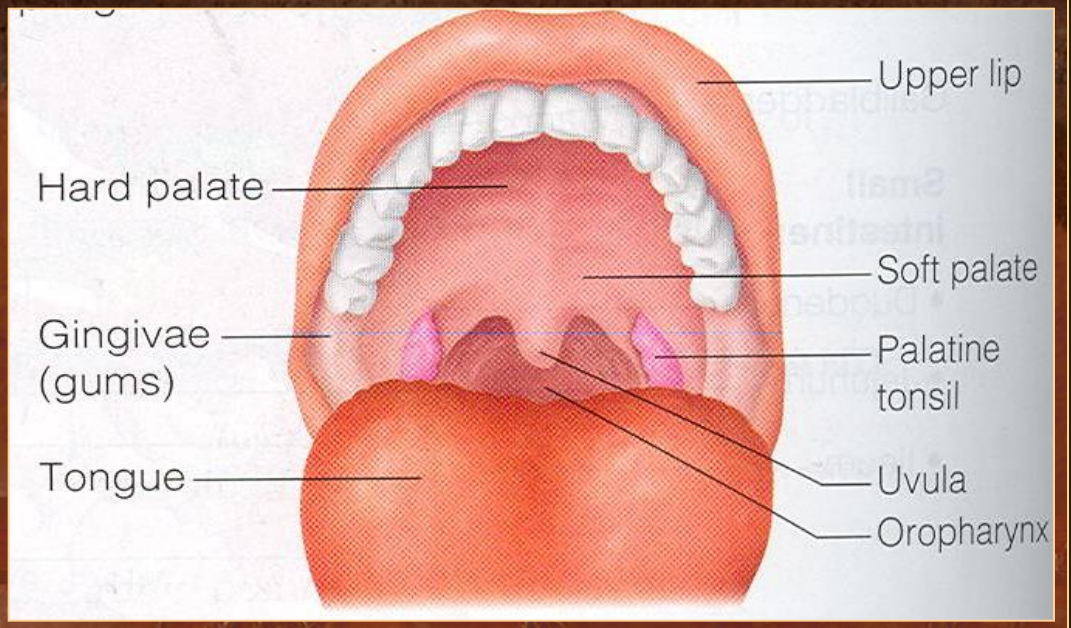


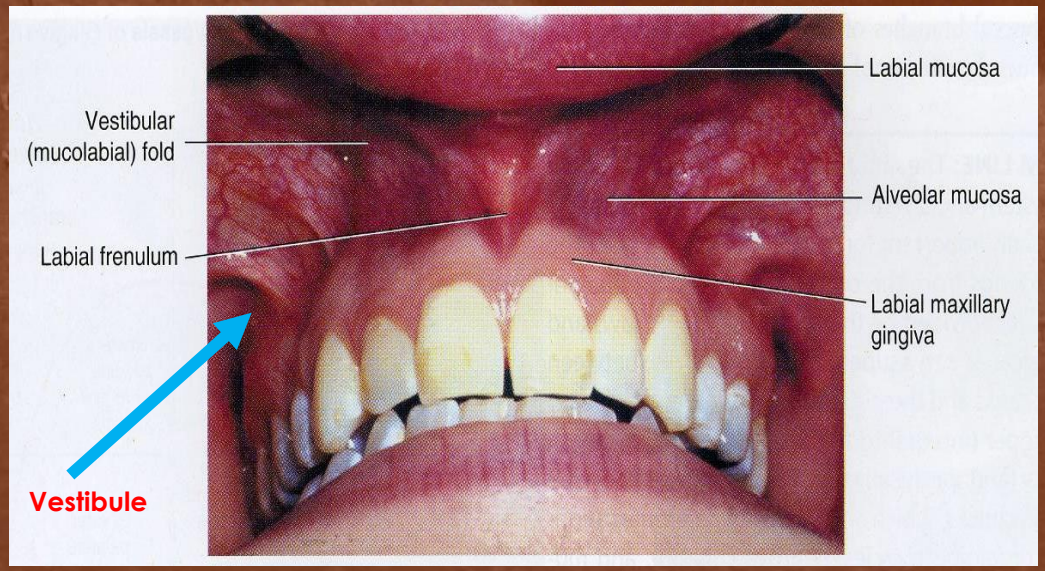
Prof. Saeed Abuel Makarem

OBJECTIVES

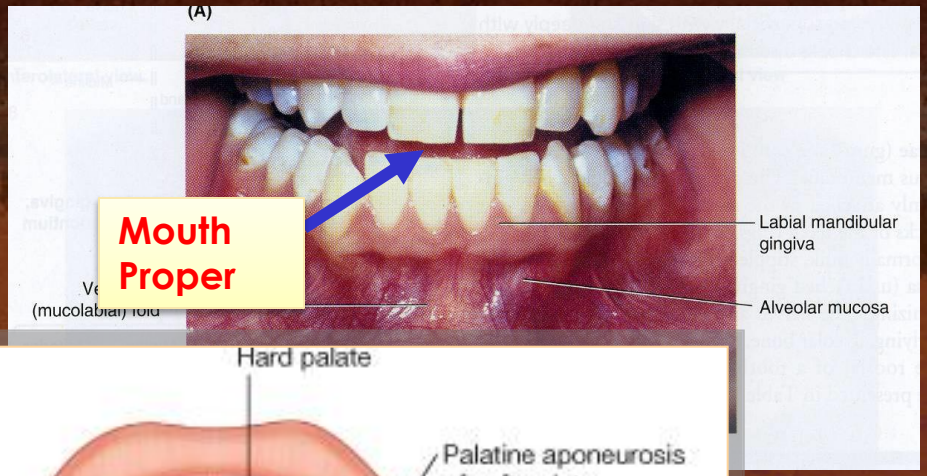
- **By the end of the lecture you should be able to**:
- Describe the anatomy of the oral cavity, (boundaries, parts, nerve supply).
- Describe the anatomy of the palate, (parts, muscles, nerve & blood supply).
- Describe the anatomy of the tongue, (structure, muscles, motor and sensory nerve supply, blood supply).
- Describe the anatomy of the **esophagus;** extent, length, parts, strictures, relations, blood & nerve supply and lymphatic.
- Describe the anatomy of the **stomach;** location, shape, parts, relations, blood & nerve supply and lymphatic.

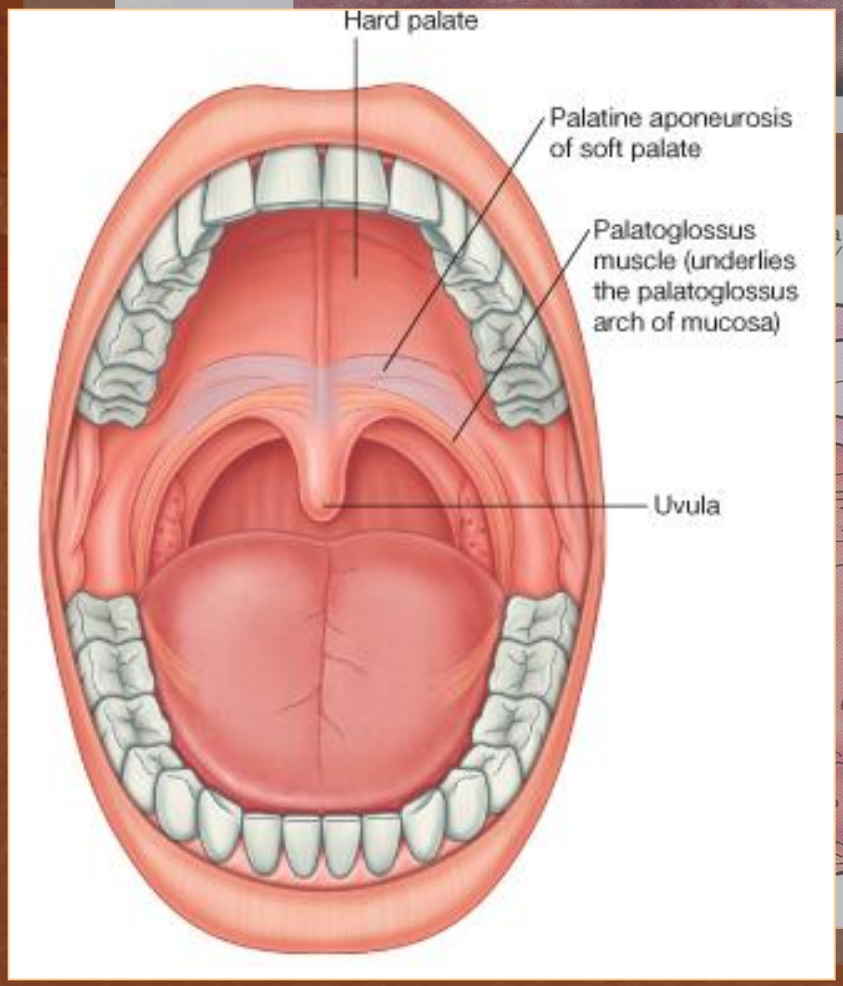
ORAL CAVITY

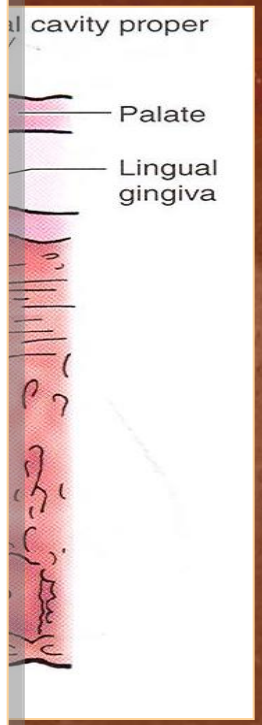




- **The mouth** extends from **lips to the** oropharyngeal isthmus (the junction between mouth & the pharynx).
- It is divided into the 1- **Vestibule:**
- Which lies between **teeth & gums** internally and **lips & cheeks** externally.
- The vestibule receives the opening of the **parotid duct** opposite the upper 2nd molar tooth.

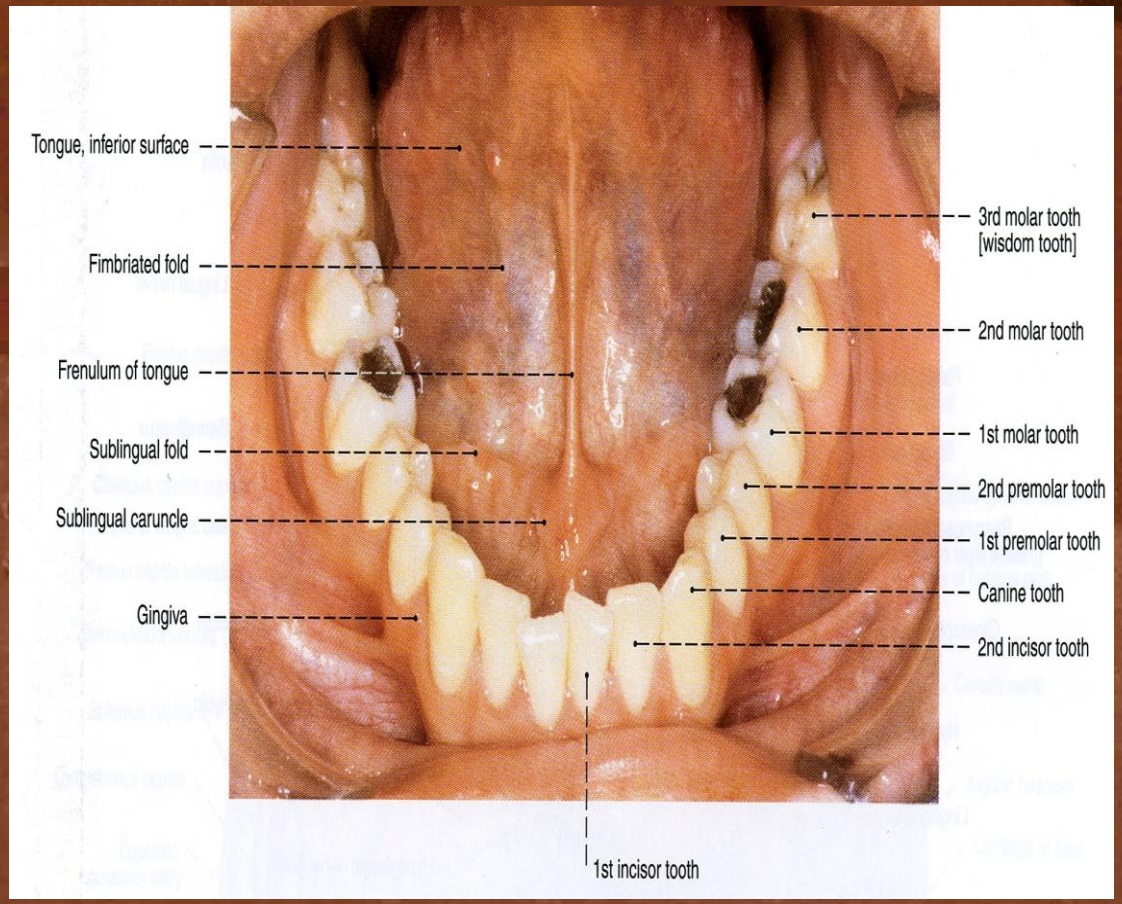






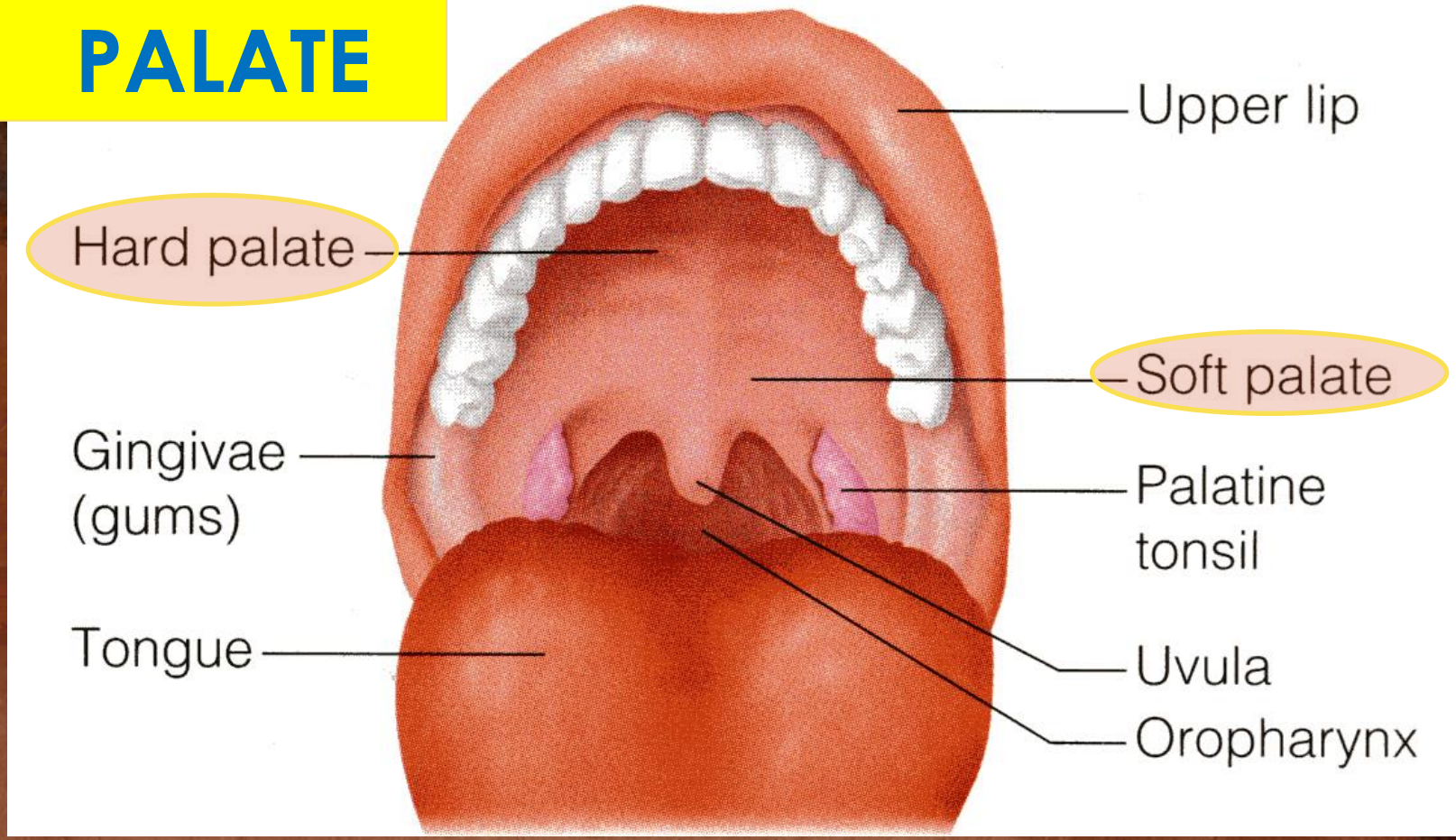
- **2. Mouth cavity proper:**
- lies within the alveolar arches, gums, and teeth
- **It** has:
- ***Roof:***
- Formed by the hard & soft palate.
- ***Floor:***
- Formed by the anterior 2/3 of the tongue
- It communicates with the vestibule behind the 3rd molar tooth, when you close your lips.

Under Surface Of The Tongue



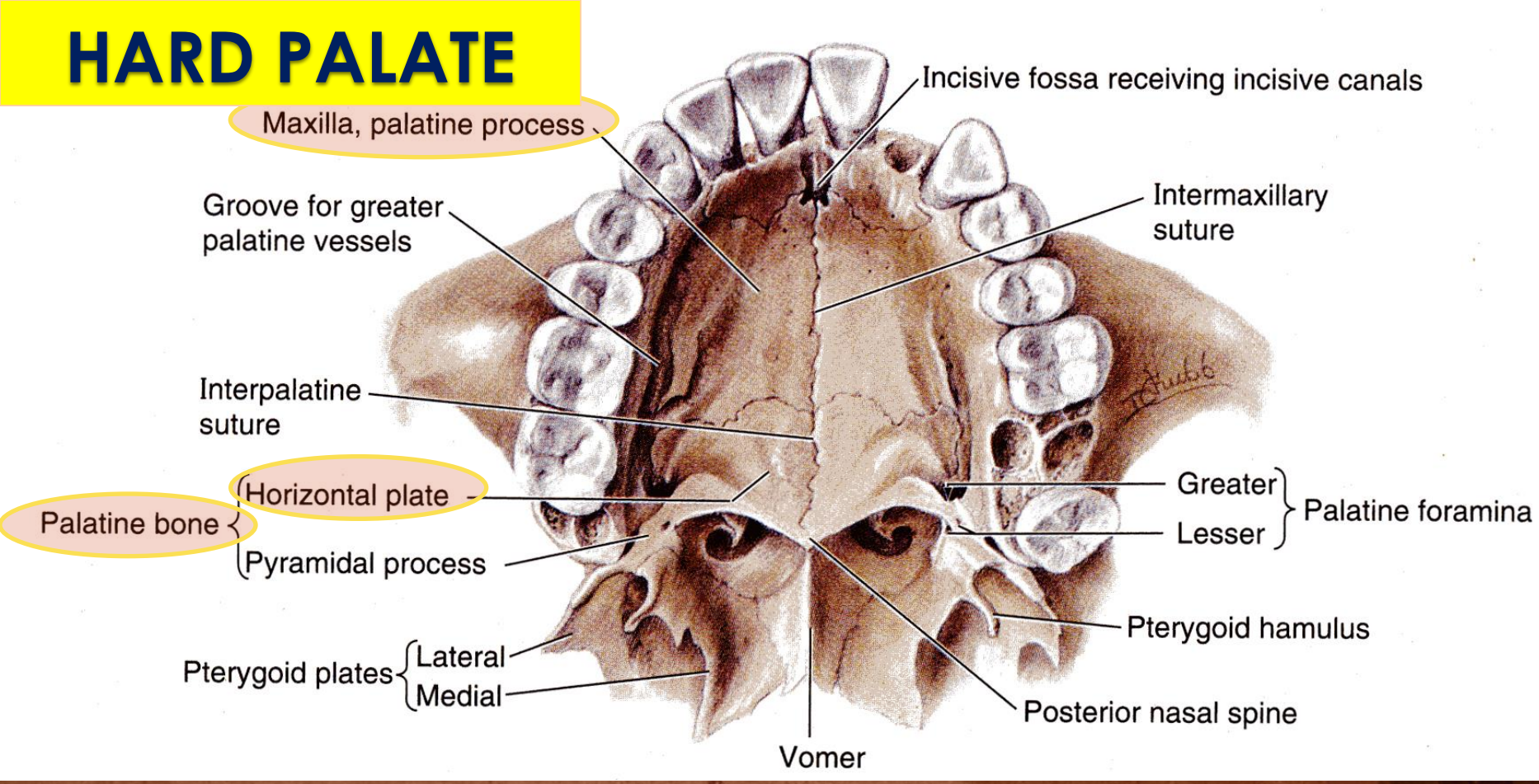
- **1. <u>Frenulum lingulae</u>** in the midline.
- It connects the under surface of the tongue to the floor of the mouth.
- **2. Orifice of the <u>Submandibular Duct</u>** opens on each side of the frenulum.
- **3. <u>Sublingual Fold</u>** (formed by the underlying sublingual salivary gland).

PALATE



- The **Palate** forms the roof of the mouth.
- It is divided into two parts:
  - The **Hard (Bony) palate** in front.
  - The **Soft palate** behind.

HARD PALATE



- **The hard palate** is formed by (4 bones),
- 2 Palatine processes of the maxillae anteriorly and 2 Horizontal plates of palatine bones posteriorly.
- **It is Bounded Laterally** by the **alveolar arches of the maxilla.**
- **Behind** it is continuous with the soft palate.
- The hard palate forms the **floor of the nasal cavities**.

SOFT PALATE

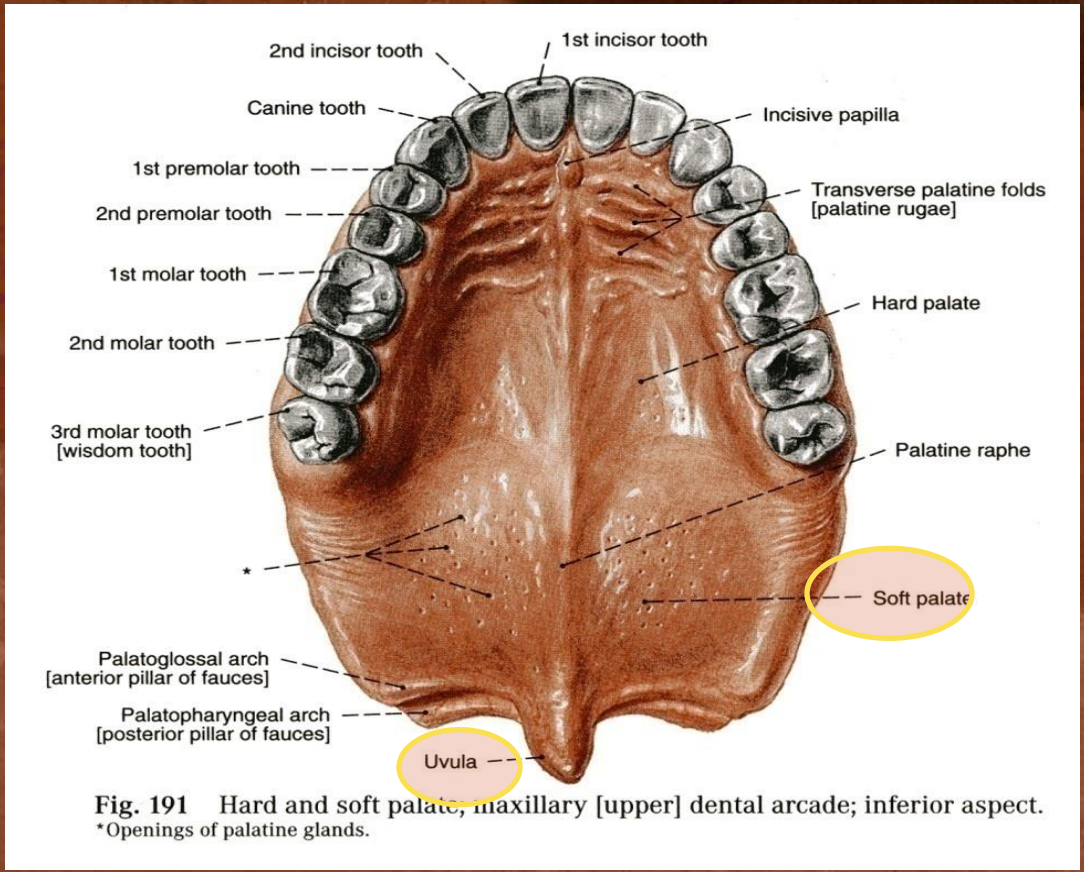
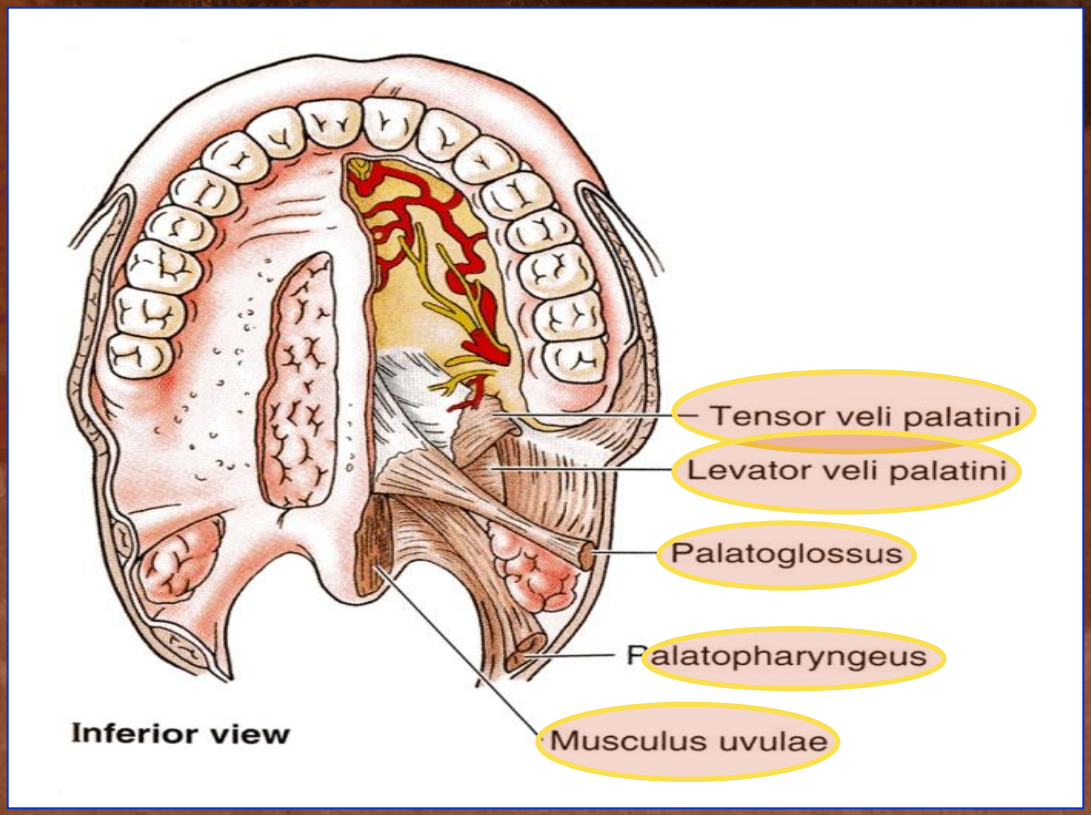


Fig. 191 Hard and soft palate, maxillary [upper] dental arcade; inferior aspect.
*Openings of palatine glands.

- It is a mobile fold formed of a bag of mucous membrane filled with striated muscles.

It is attached to the posterior border of the hard palate.
Its free posterior border is a conical projection called the **uvula.**

MUSCLES OF THE SOFT PALATE



5 pairs of muscles:

1-Tensor veli palatini,
2- Levator veli palatini,
3- Palatoglossus,
4- Palatopharyngeus,
5- Musculus uvulae.

NERVE SUPPLYOF SOFT PALATE

▪Motor:

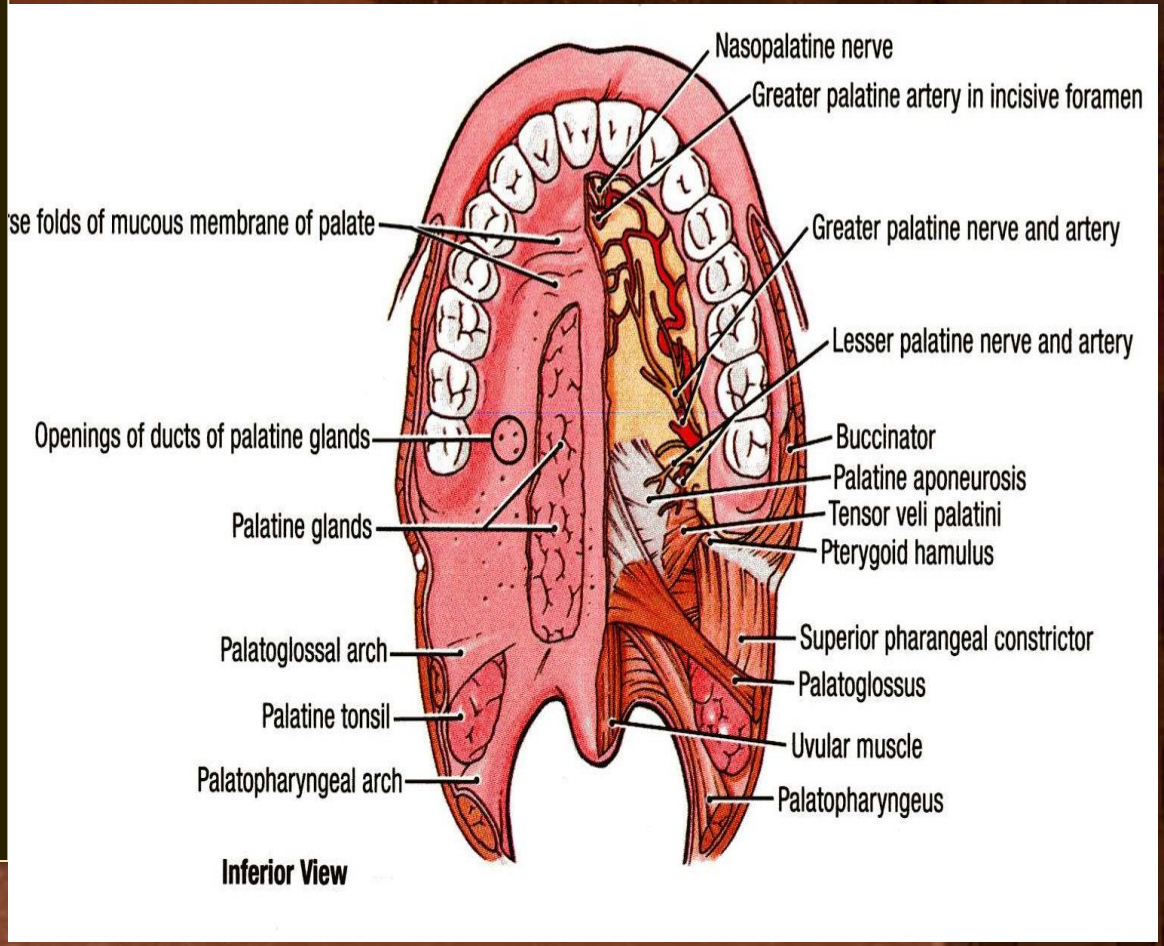
▪All muscles of the palate are supplied by pharyngeal plexus of nerves EXCEPT tensor veli palatini (by mandibular nerve).

▪ Motor innervation of soft palate can be tested by saying ‘Ah’, normally soft palate rises upward and the uvula moves backward in the middle line.

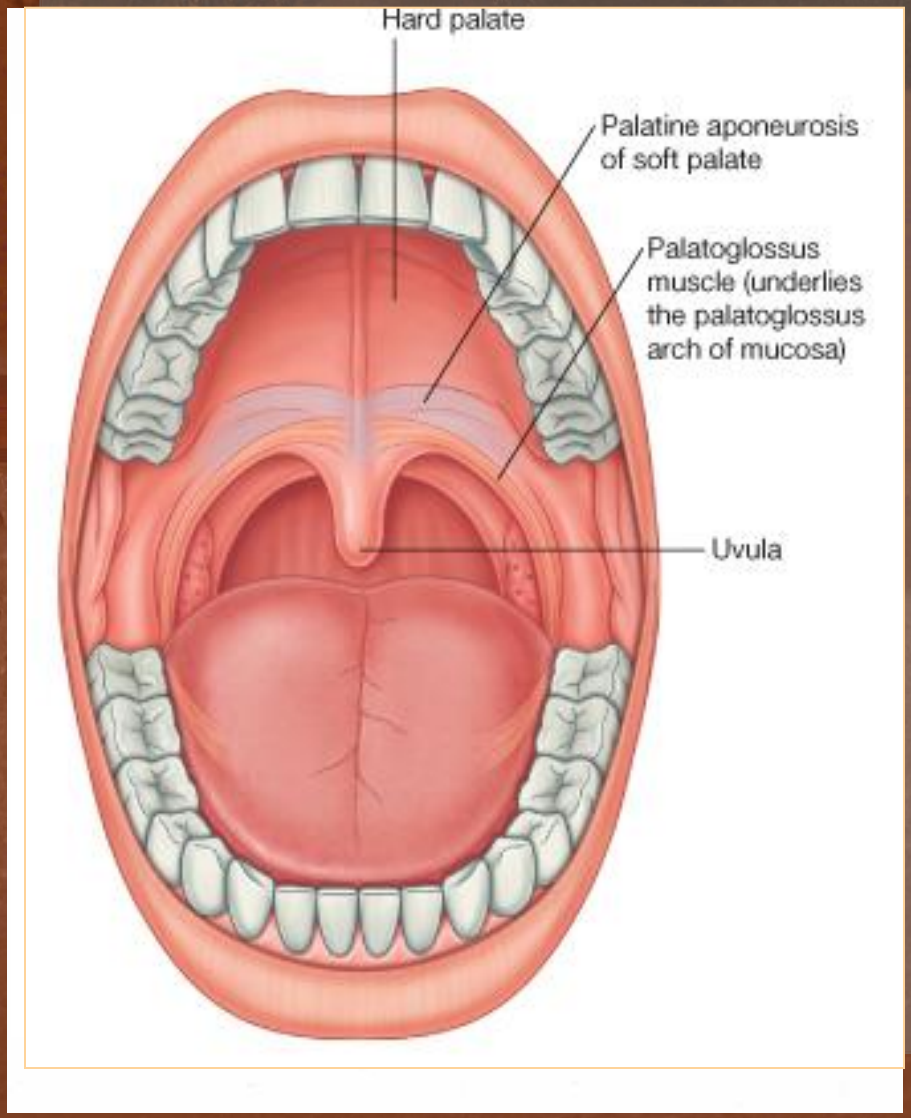
▪Sensory:

1. ***Maxillary nerve through:***
- Greater palatine,
- Lesser palatine &
- Nasopalatine nerves.

2. ***Glossopharyngeal nerve.***

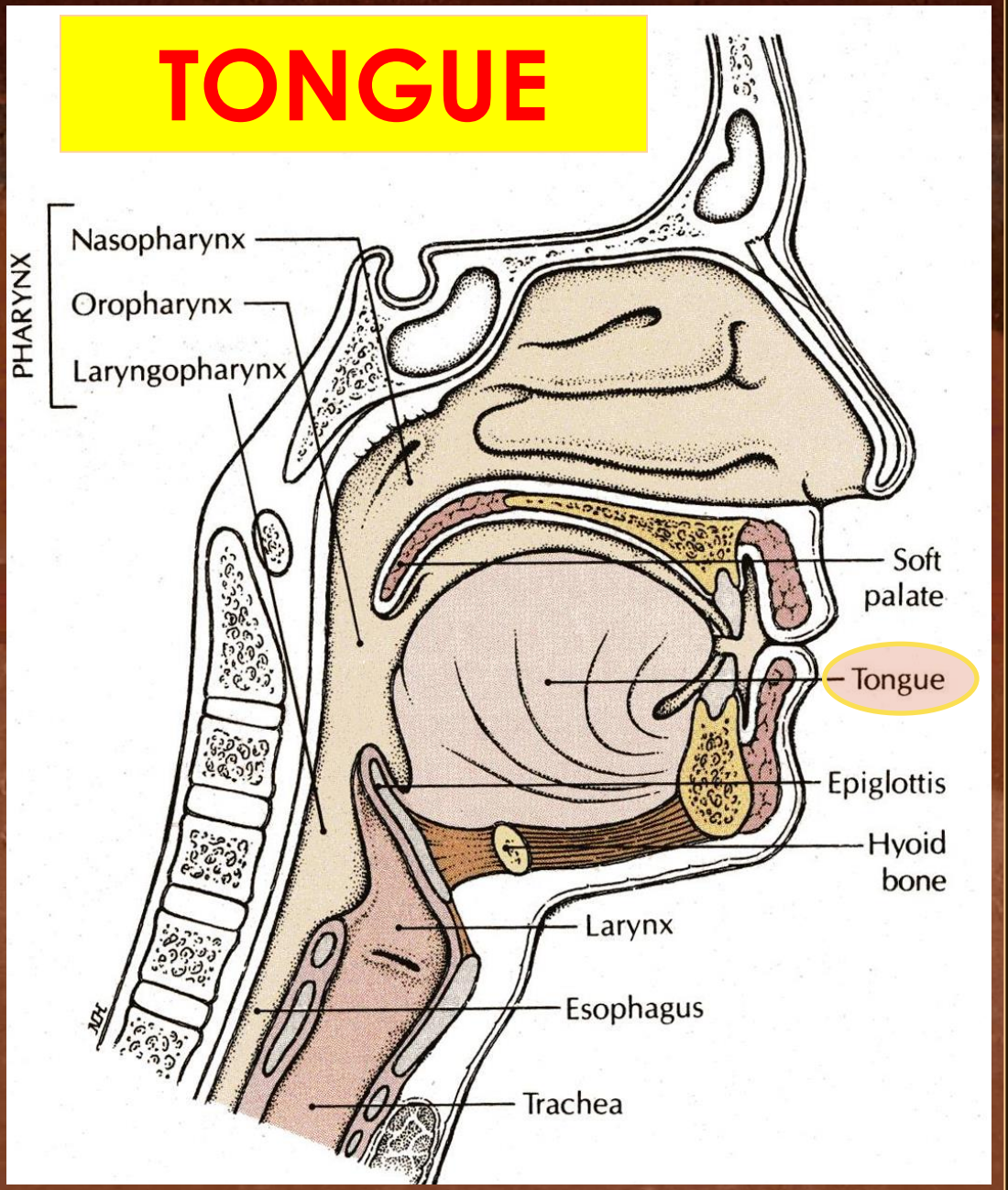


MOVEMENTS OF SOFT PALATE



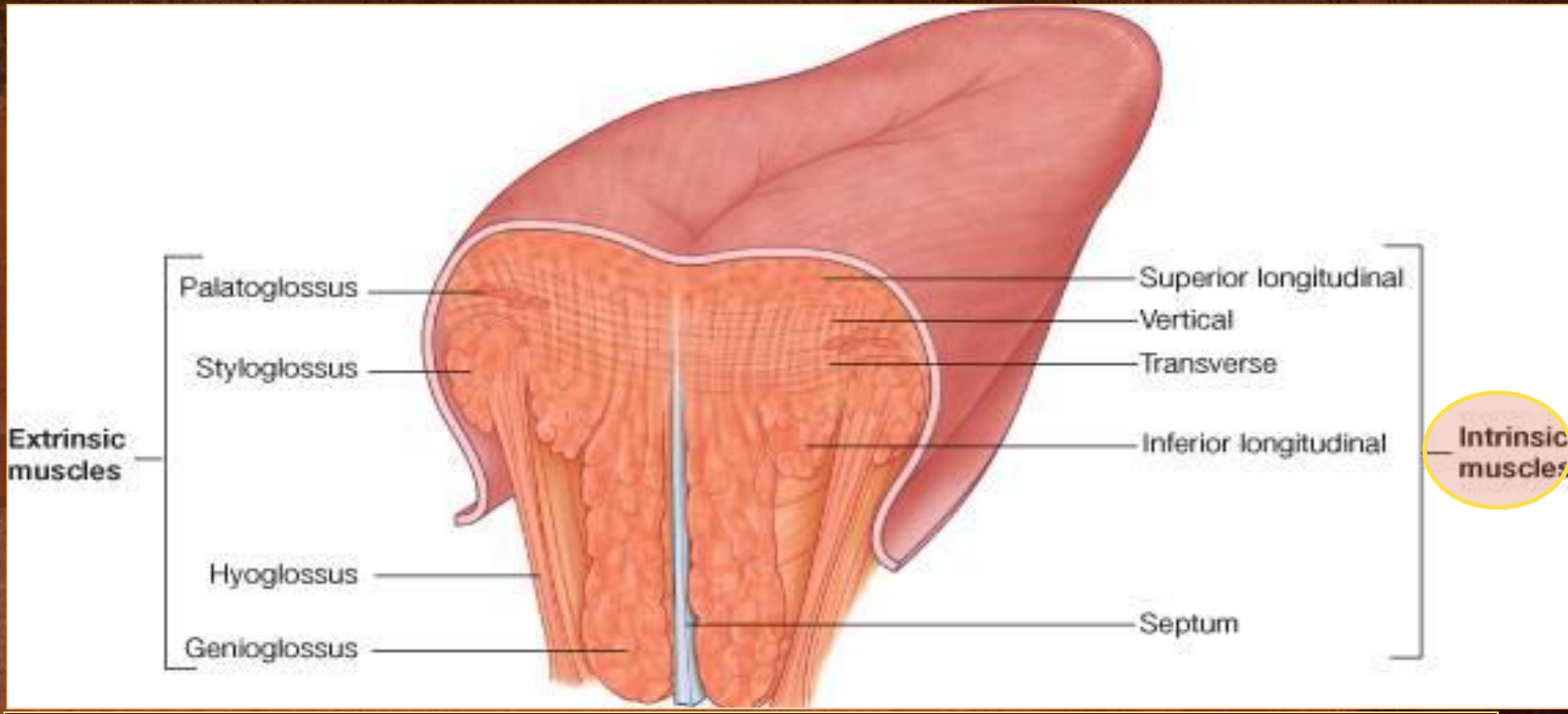
- **Pharyngeal isthmus:**
- (It is the communicating between nasal and oral parts of the pharynx) It ***is closed by raising the soft palate upward.***
- ***Closure occurs during the production of explosive consonants in speech and swallowing.***
- Soft palate **is raised** by the contraction of the levator veli palatini and Palatopharyngeus.
- At the same time, the posterior wall of the pharynx is pulled forward.
- The **palatopharyngeus muscles** on both sides also contract so that the palatopharyngeal arches are pulled medially, like side curtains.
- *By this means the nasal part of the pharynx is closed off from its oral part.*

TONGUE



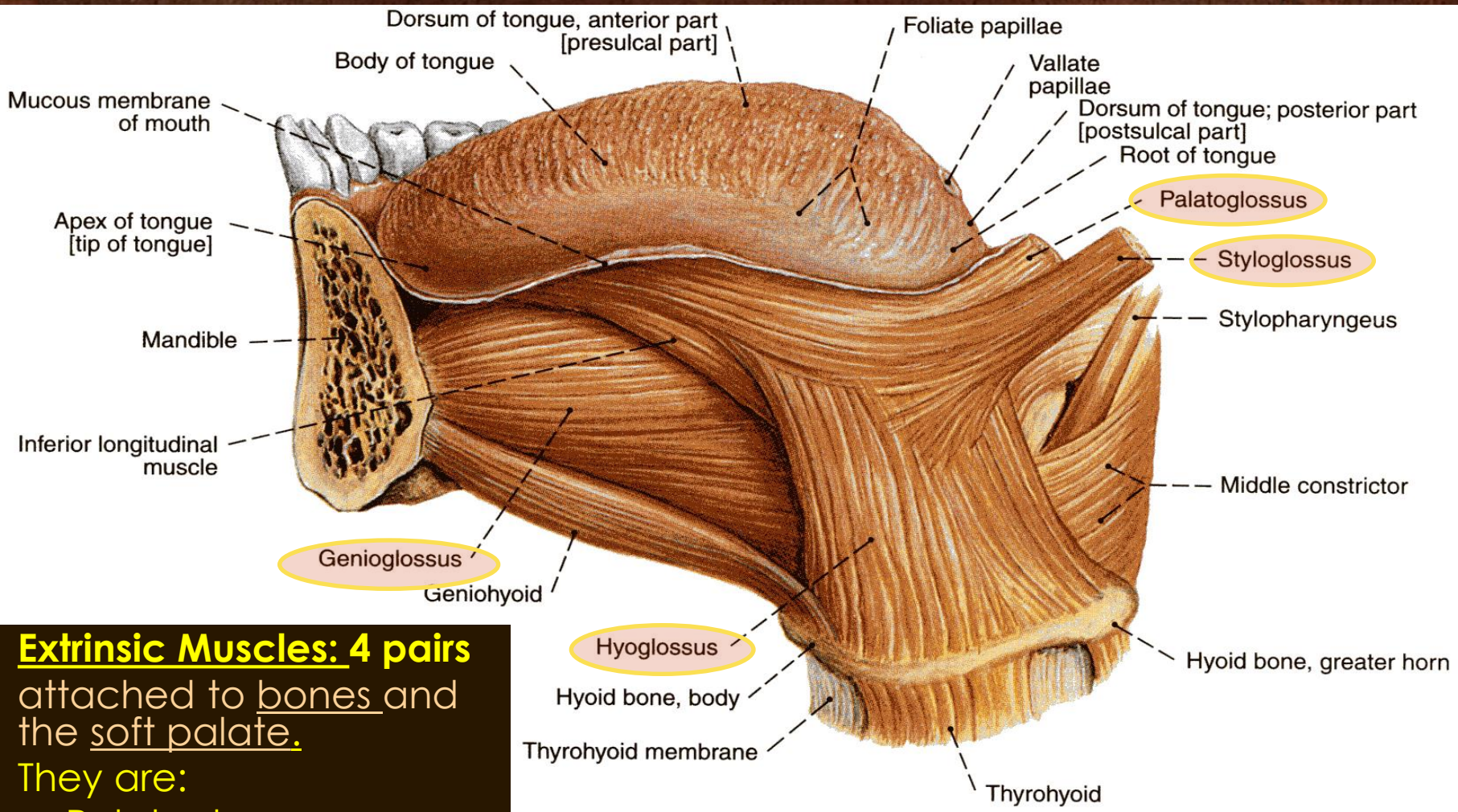
- **Tongue** is a mass of striated muscle covered with mucous membrane.
- Its anterior 2/3 lies in the mouth, and its posterior 1/3 lies in the pharynx.
- It is attached **above** to:
- Styloid process &
- Soft palate.
- It is attached **Below** to:
- Mandible &
- hyoid bone.
- The tongue is essential for several **Important Functions:**
- Normal articulation of the jaw,
- Manipulation of food,
- Swallowing,
- Taste.
- Speech.

MUSCLES OF THE TONGUE



- **Muscles** of the tongue are divided into two types**:**
- **Intrinsic** and **Extrinsic.**
- **The intrinsic muscles** are restricted to the tongue and are **not attached to bone.**
- They consist of **longitudinal, transverse, and vertical fibers.**
- **Action:** Alter the shape of the tongue while it lies in the mouth cavity.

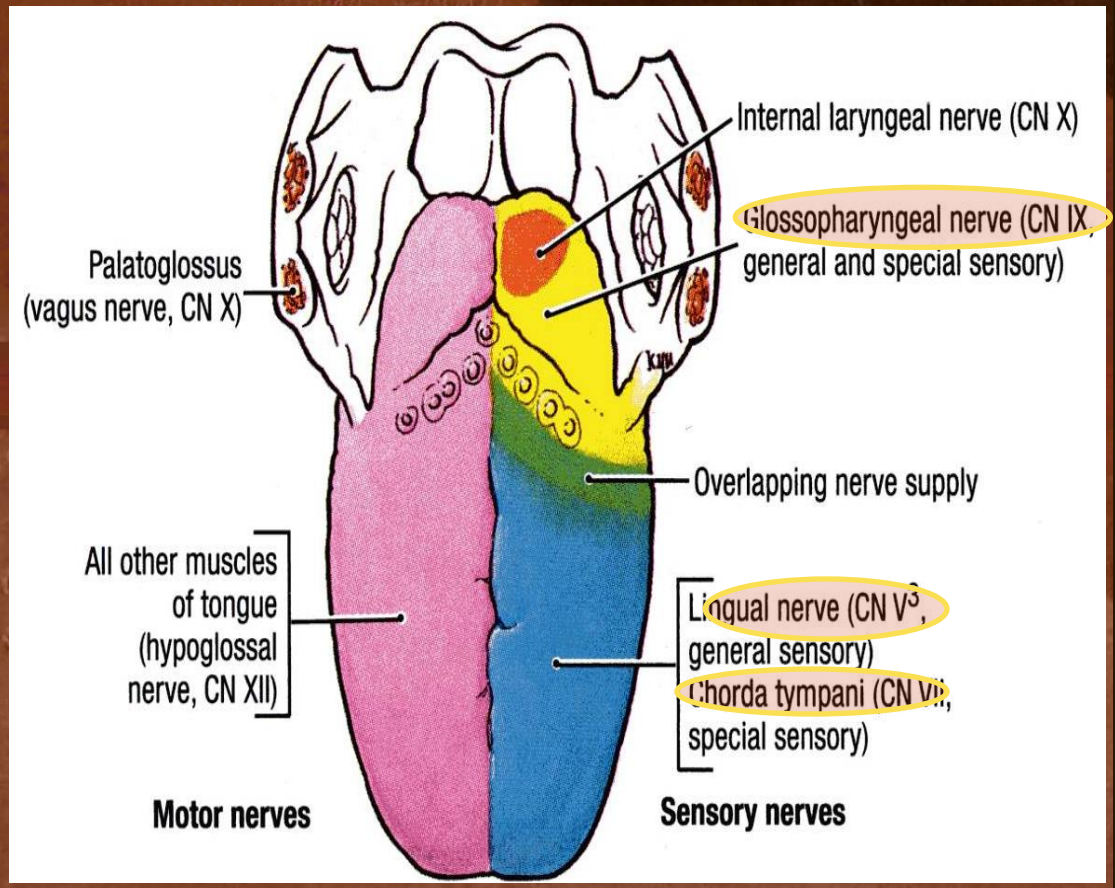
Extrinsic Muscles of the Tongue



- **Extrinsic Muscles: 4 pairs**
- attached to bones and the soft palate.
- They are:
  - Palatoglossus.
  - Styloglossus,
  - Genioglossus&
  - Hyoglossus.

All muscles of the tongue are supplied by the **Hypoglossal nerve** EXCEPT Palatoglossus which is supplied by the Pharyngeal plexus.

SENSORY INNERVATION



Anterior 2/3:

- General sensations; (Lingual) nerve.
- Taste fibers **EXCEPT** the vallate papillae, Chorda Tympani of the (Facial) nerve.

Posterior 1/3:

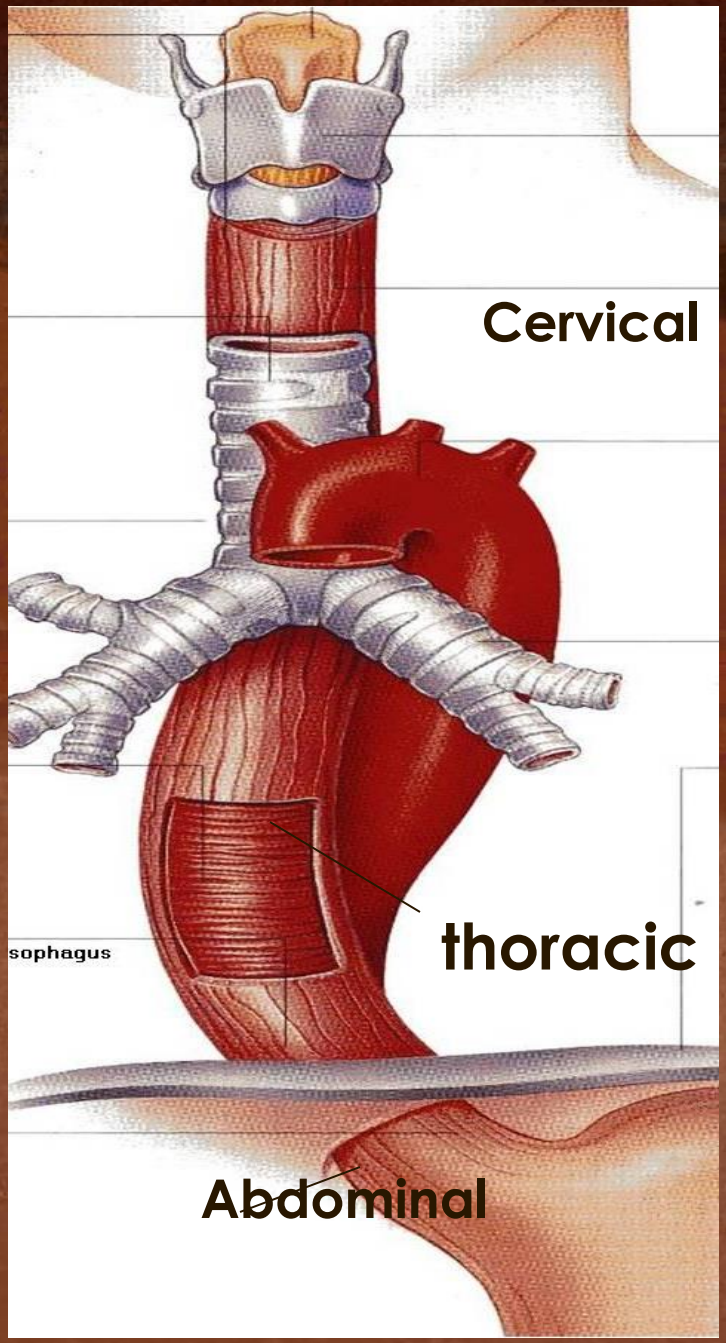
(including the vallate papillae):

- *General & taste* (Glossopharyngeal) nerve.

Root of the tongue and Epiglottis:

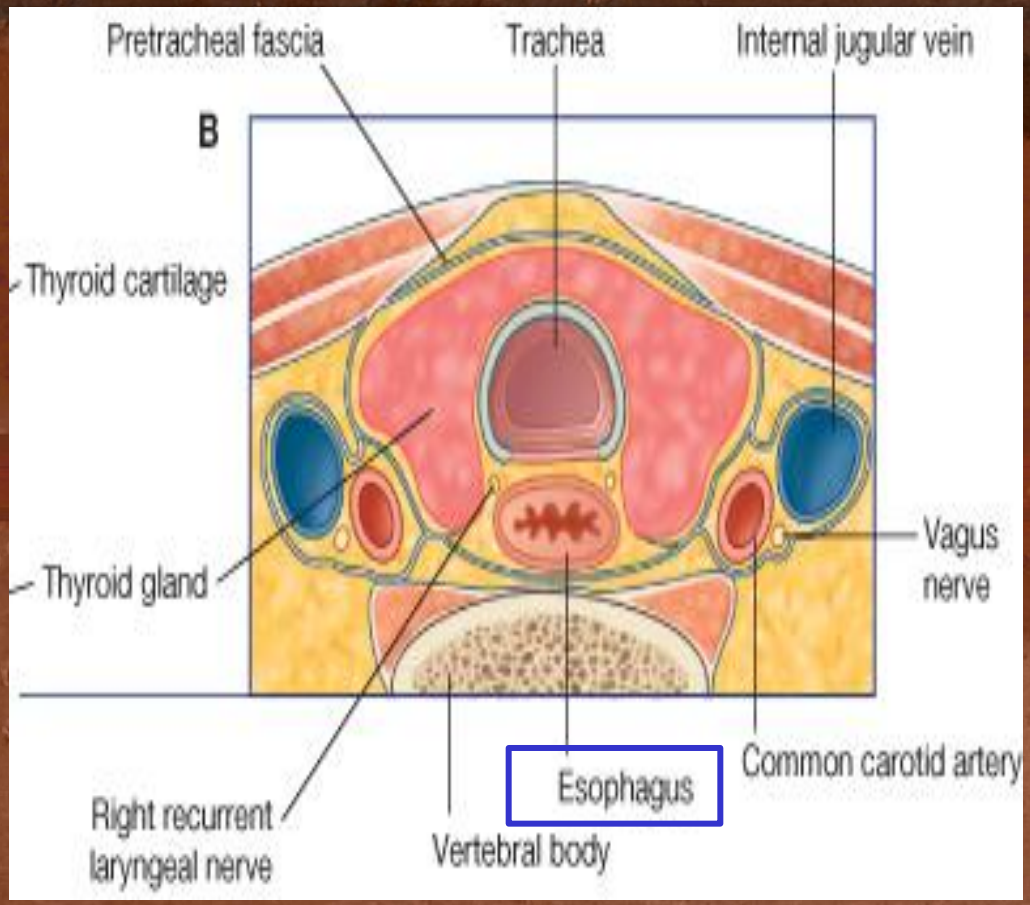
- General & taste sensations are carried by the (Vagus nerve).

ESOPHAGUS

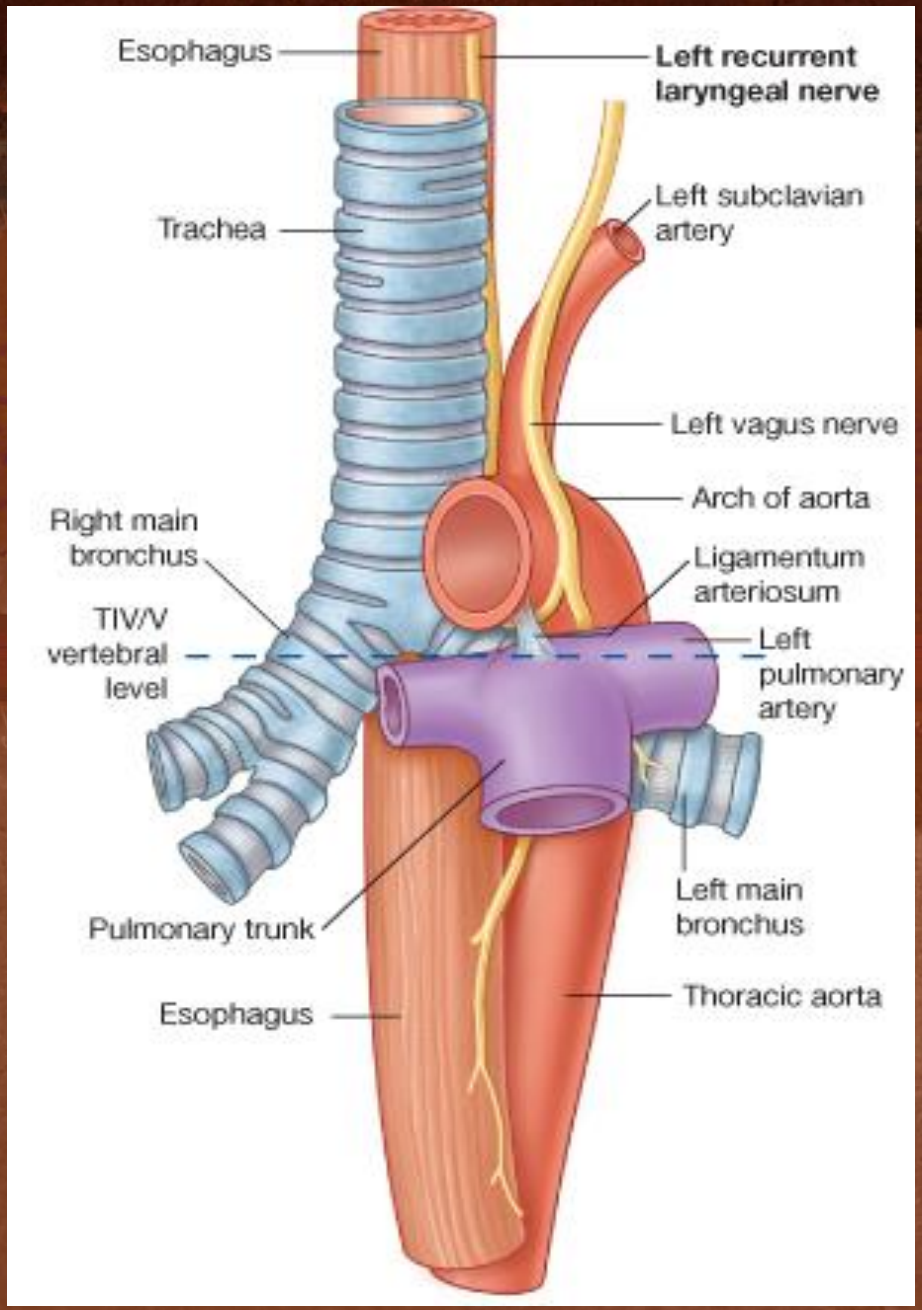


- It is a tubular structure about 25 cm long.
- It begins as the continuation of the pharynx at the level of the **6th** cervical vertebra.
- It pierces the diaphragm at the level of the **10th** thoracic vertebra to join the stomach.
- **It is formed of 3 parts:**
- Cervical
- Thoracic
- Abdominal

CERVICAL PART "RELATIONS"



- **Posteriorly:**
- Vertebral column.
- **Laterally:**
- Lobes of the thyroid gland.
- **Anteriorly:**
- Trachea and the recurrent laryngeal nerves.

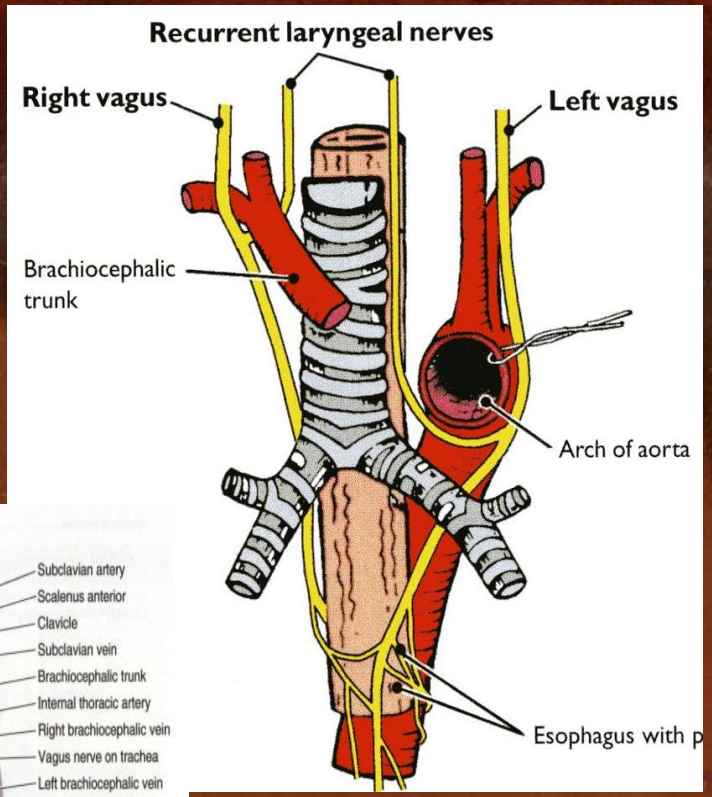


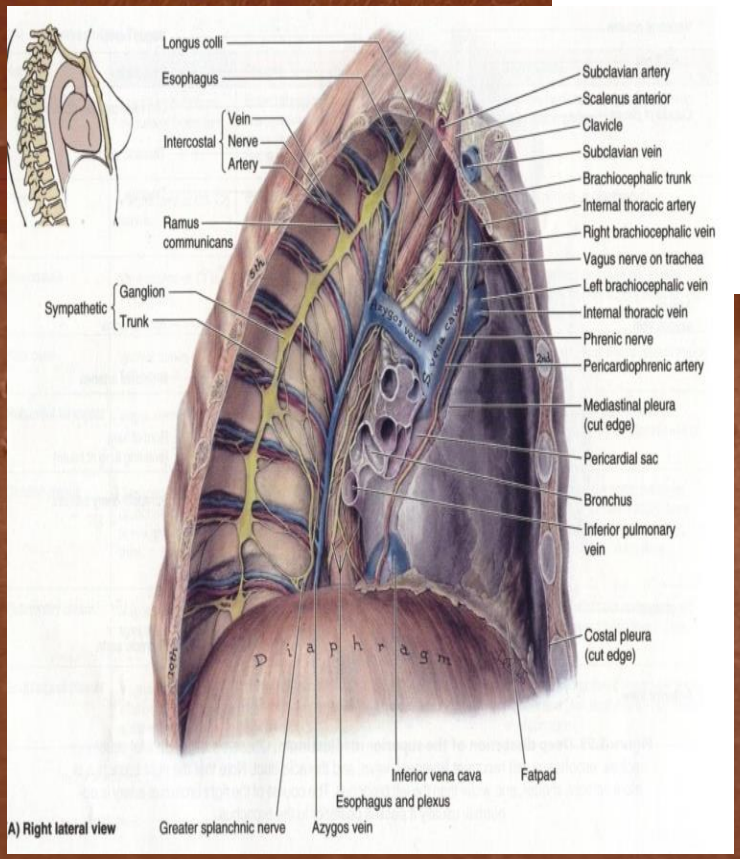
THORACIC PART

- In the thorax, it passes downward and to the **left** through superior and then to posterior mediastinum.
- At the level of the sternal angle, the **aortic arch and left main bronchus** push the esophagus again to **the midline**.

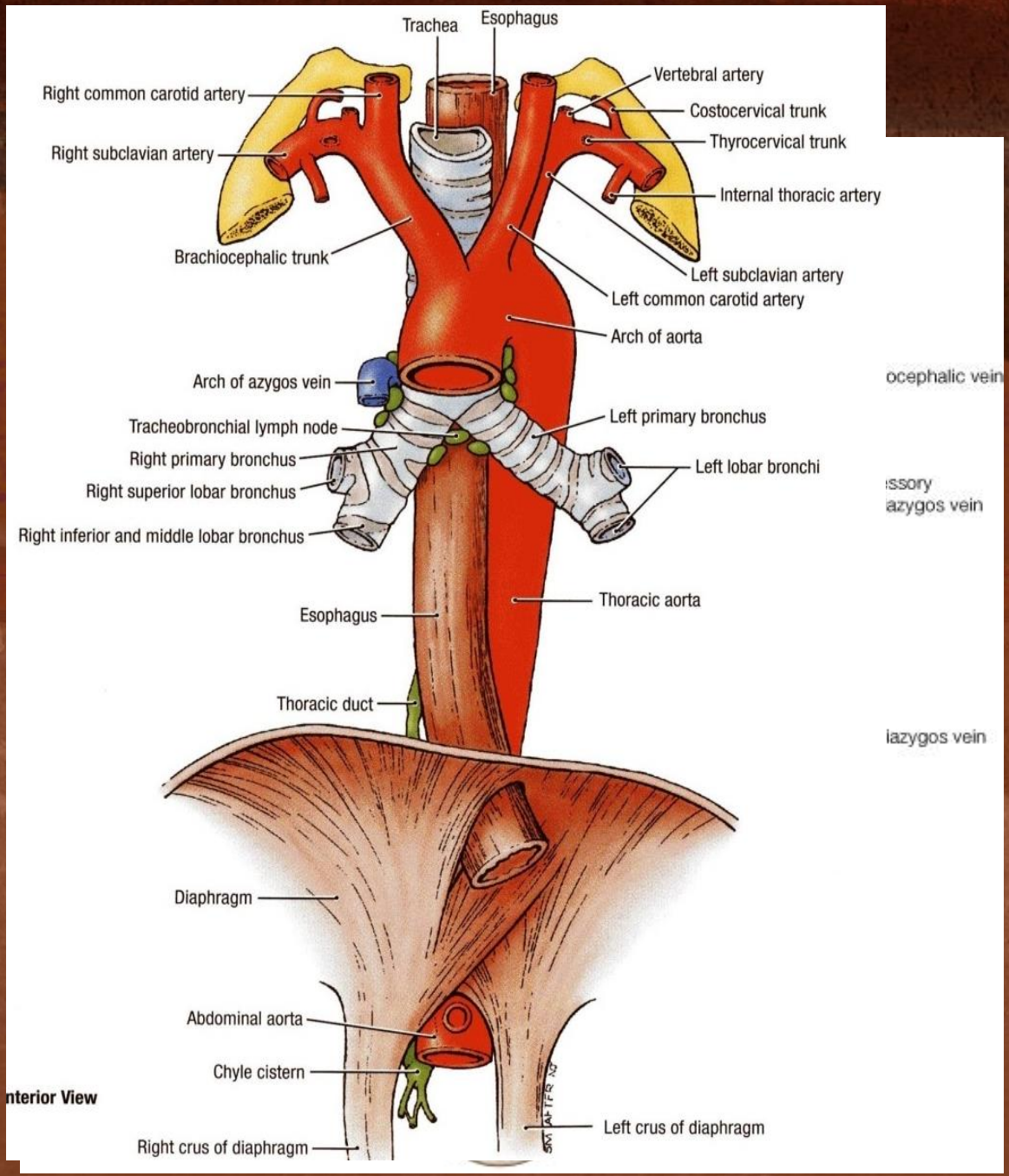
Thoracic part

ANTERIOR RELATIONS





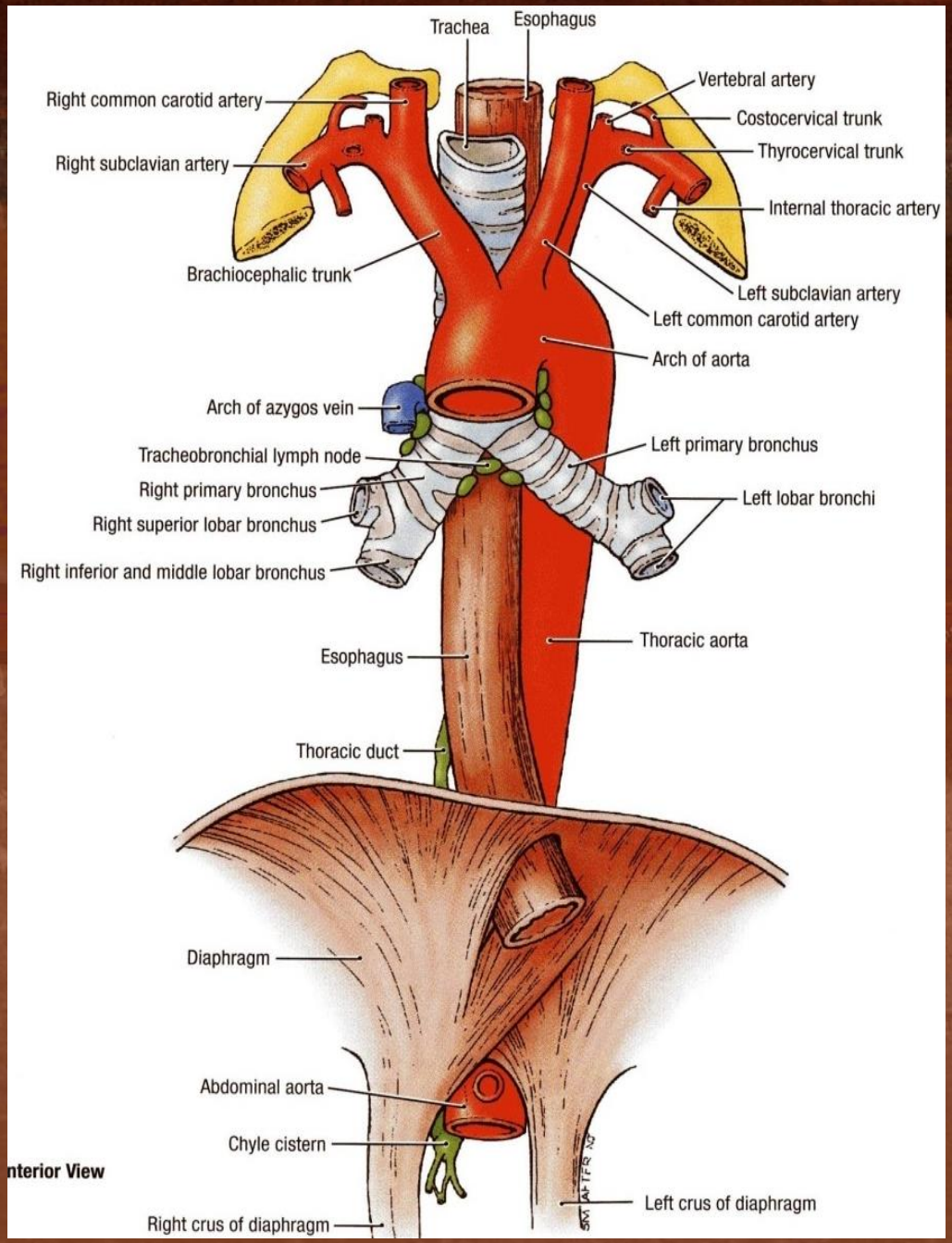
- Trachea.
- Left recurrent laryngeal nerve.
- Left principal bronchus.
- Pericardium
- Left atrium!!!!!!!



POSTERIOR RELATIONS

- Bodies of the thoracic vertebrae.
- Thoracic duct.
- Azygos vein.
- Right posterior intercostal arteries.
- Descending thoracic aorta (at the lower end).

LATERAL RELATIONS



- **On the Right side:**

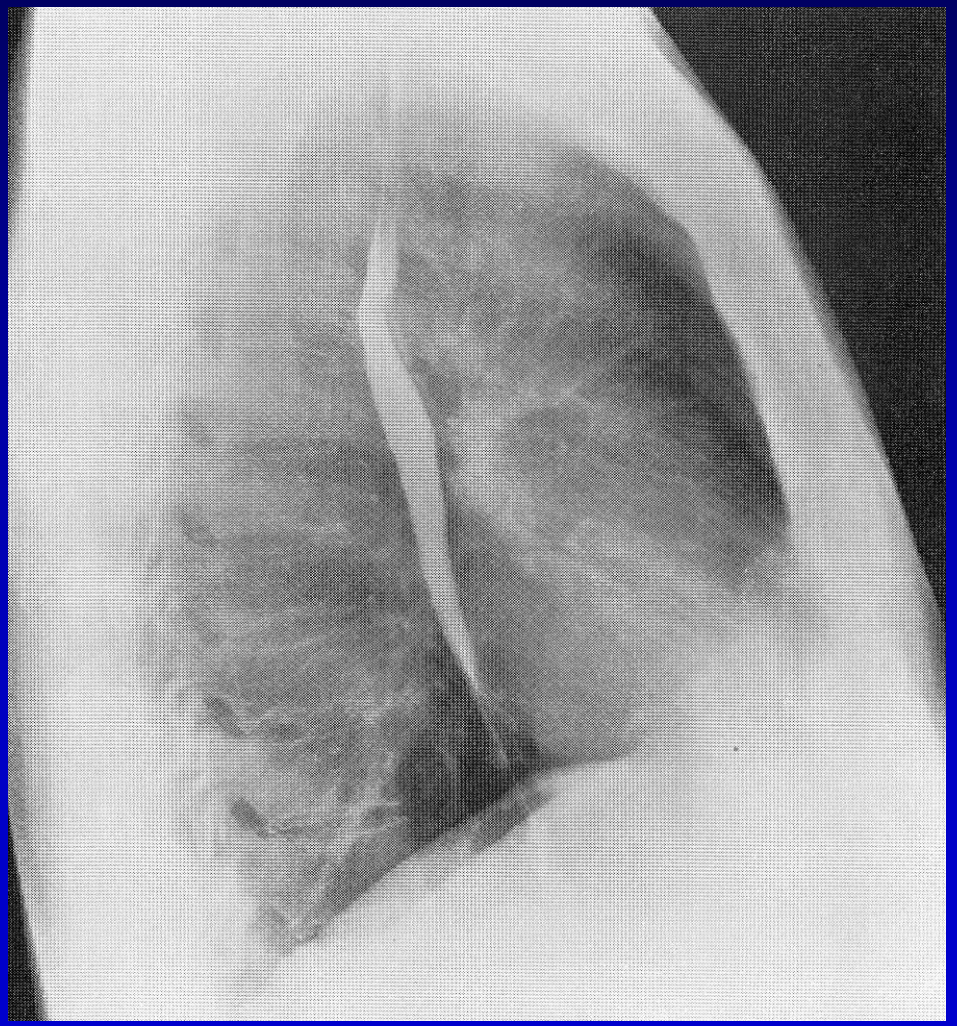
1. Right pleura.
2. Terminal part of the azygos vein.

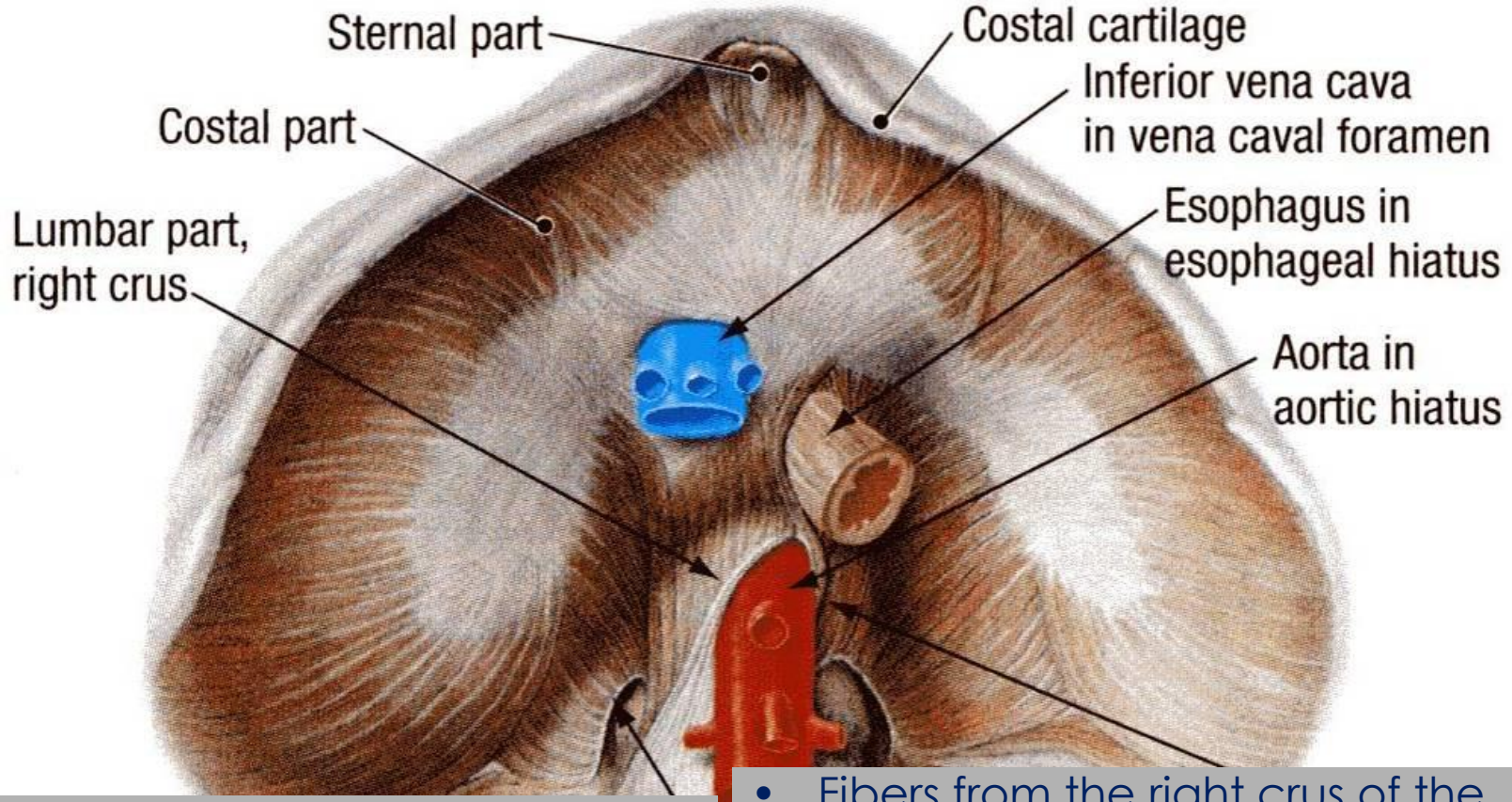
- **On the Left side:**

1. Left pleura.
2. Left subclavian artery.
3. Aortic arch.
4. Thoracic duct.

ESOPHAGUS AND LEFT ATRIUM

- There is a close relationship between the left atrium of the heart and the esophagus.
- **What is the clinical application?**
- A *barium swallow* will help the physician to **assess the size of the left atrium, (Dilation)** as in case of a heart failure, or long standing mitral stenosis.



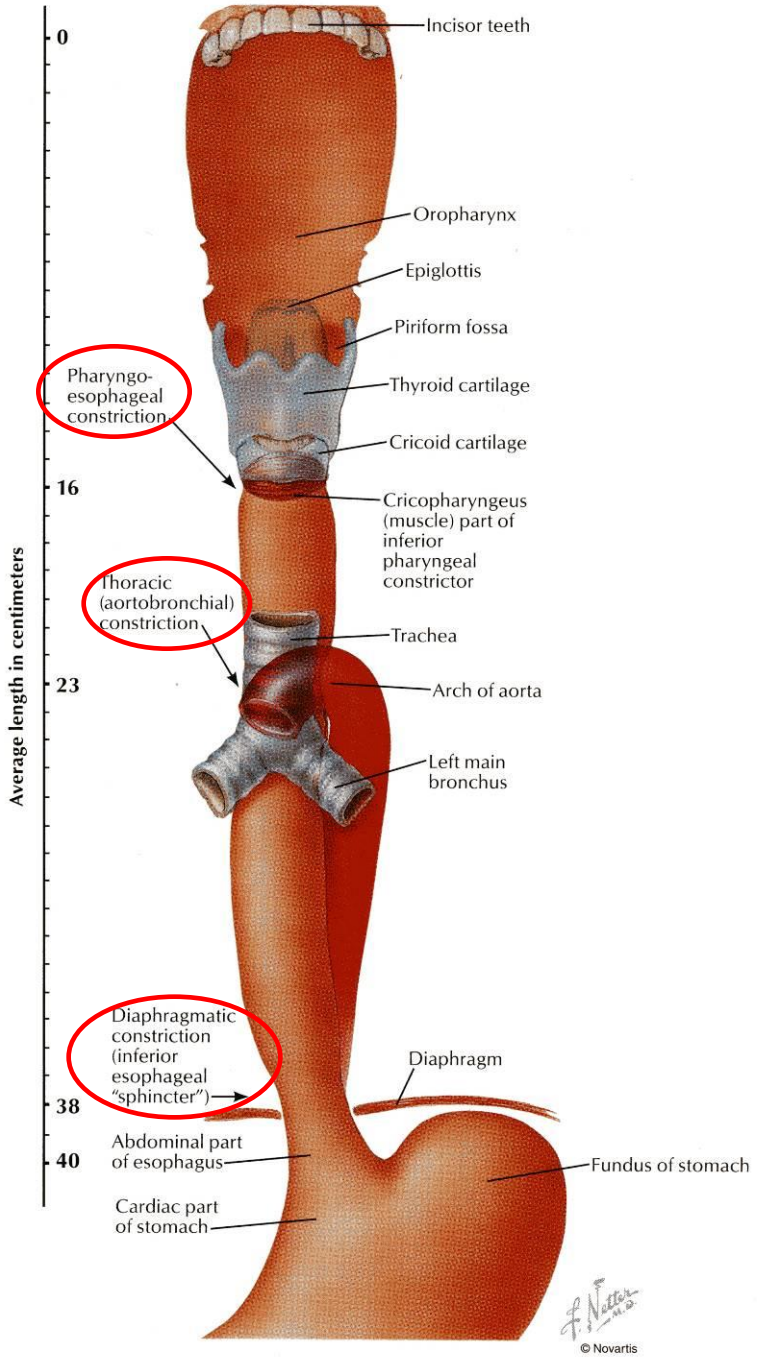


- In the abdomen, the esophagus descends for 1.3 cm and joins the stomach.
- Anteriorly, it is related to the **left lobe** of the liver.
- Posteriorly, it is related to the **left crus** of the diaphragm.

- Fibers from the right crus of the diaphragm form a **sling** around the esophagus.
- At the opening of the diaphragm, the esophagus is accompanied by:
  - The two vagi
  - **Branches of the left gastric vessels**
  - Lymphatic vessels.

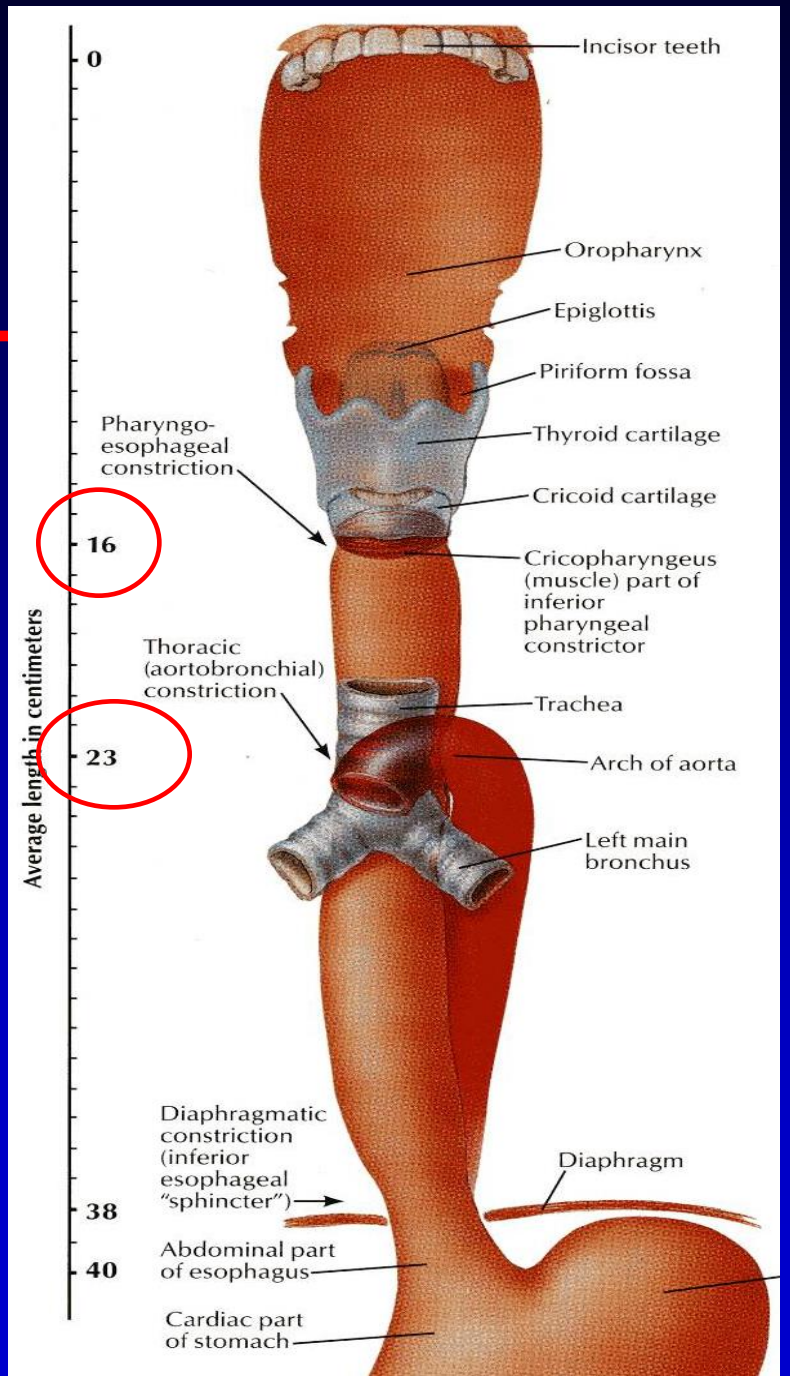
ESOPHAGEAL CONSTRICTIONS

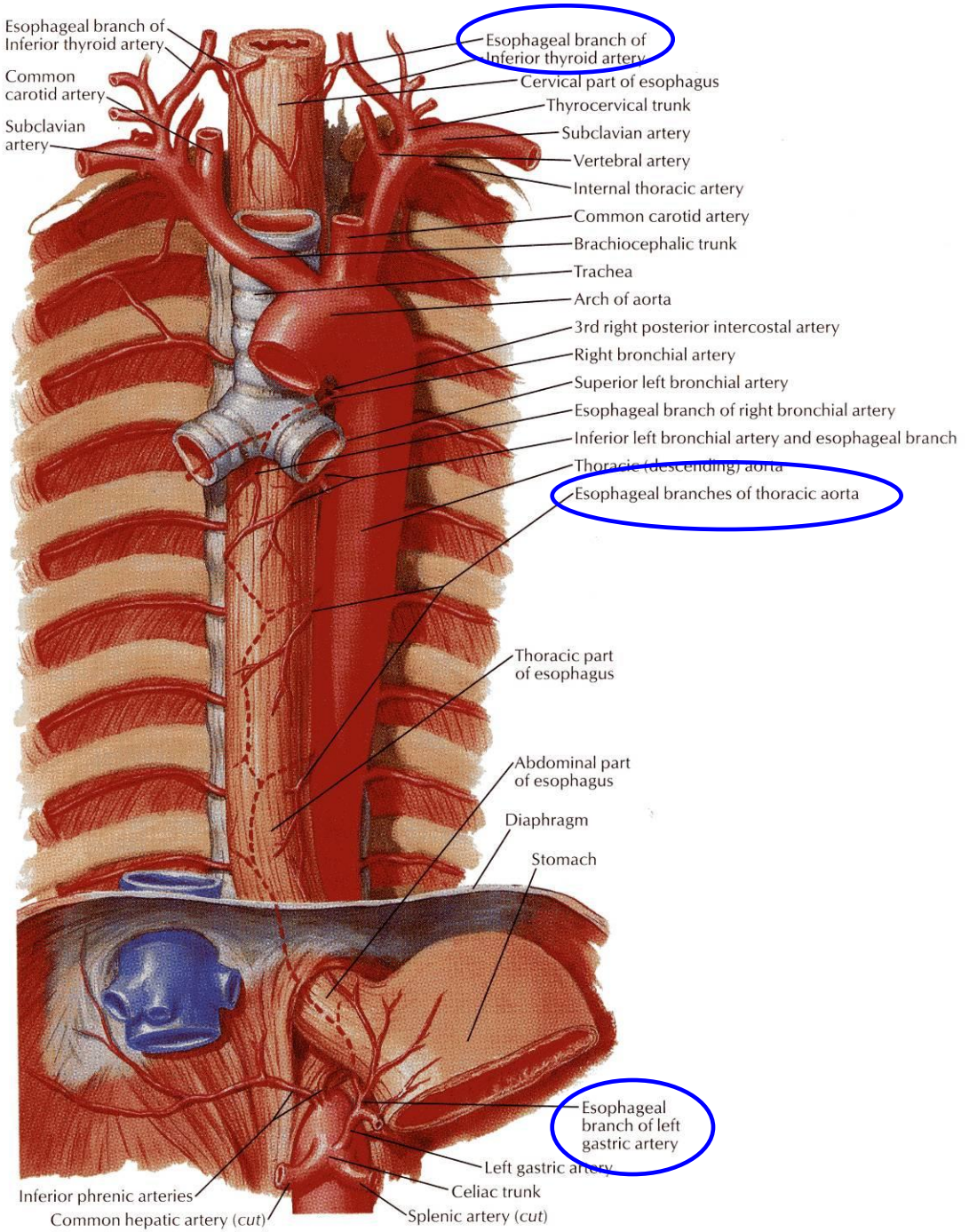
- The esophagus has **3** anatomic constrictions.
- The first is at the junction with the pharynx.
- The second is at the crossing with the aortic arch and the left main bronchus.
- The third is at the junction with the stomach.
- They have a considerable clinical importance.
- Why?



ESOPHAGEAL STRICTURES

1. They may cause difficulties in passing an *esophagoscope.*
2. In case of swallowing of caustic liquids (mostly in children), this is where the burning is the worst and **strictures** develop.
3. The esophageal strictures are a common place of the development of **esophageal carcinoma.**
4. *In this picture what is the importance of the scale?*

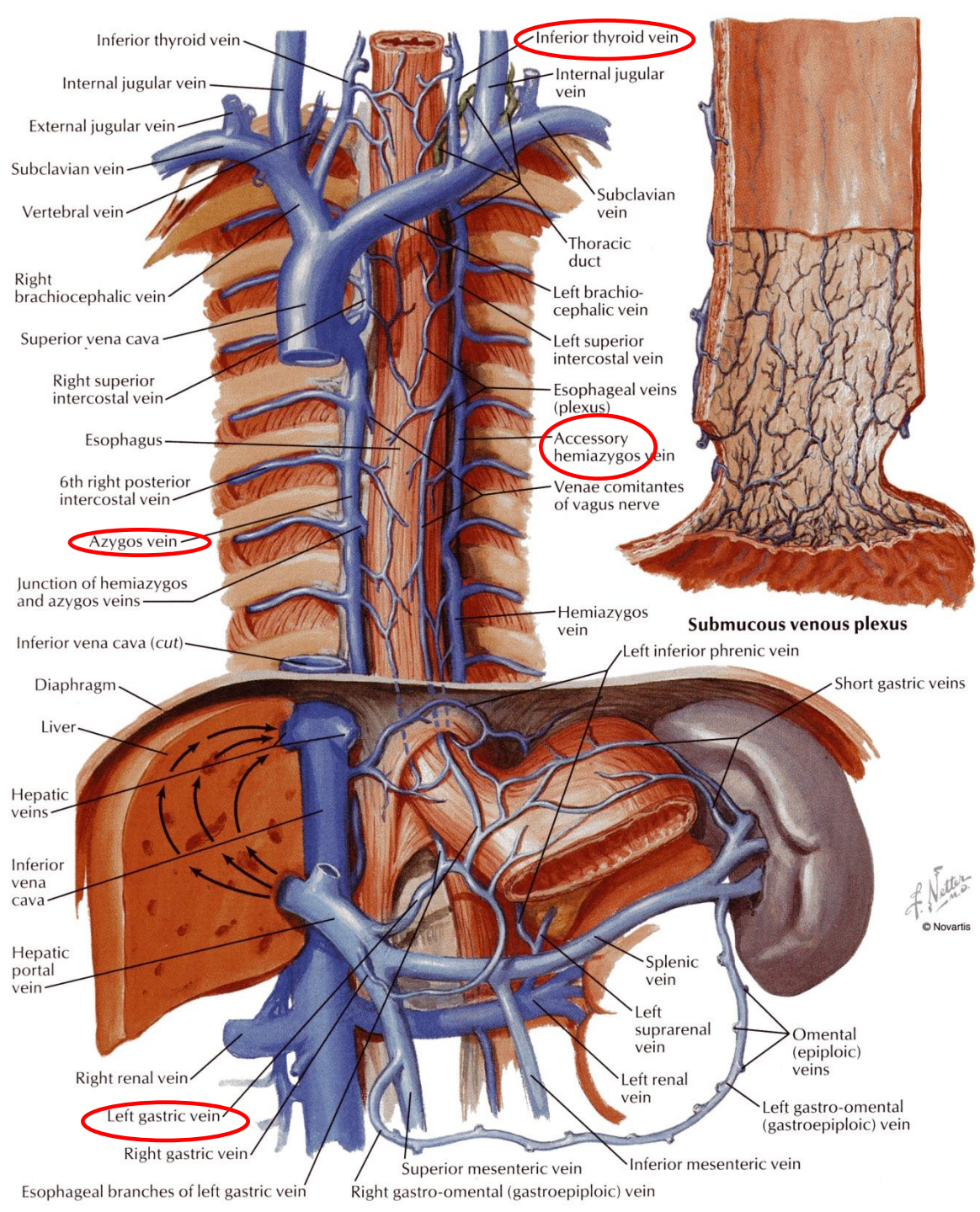




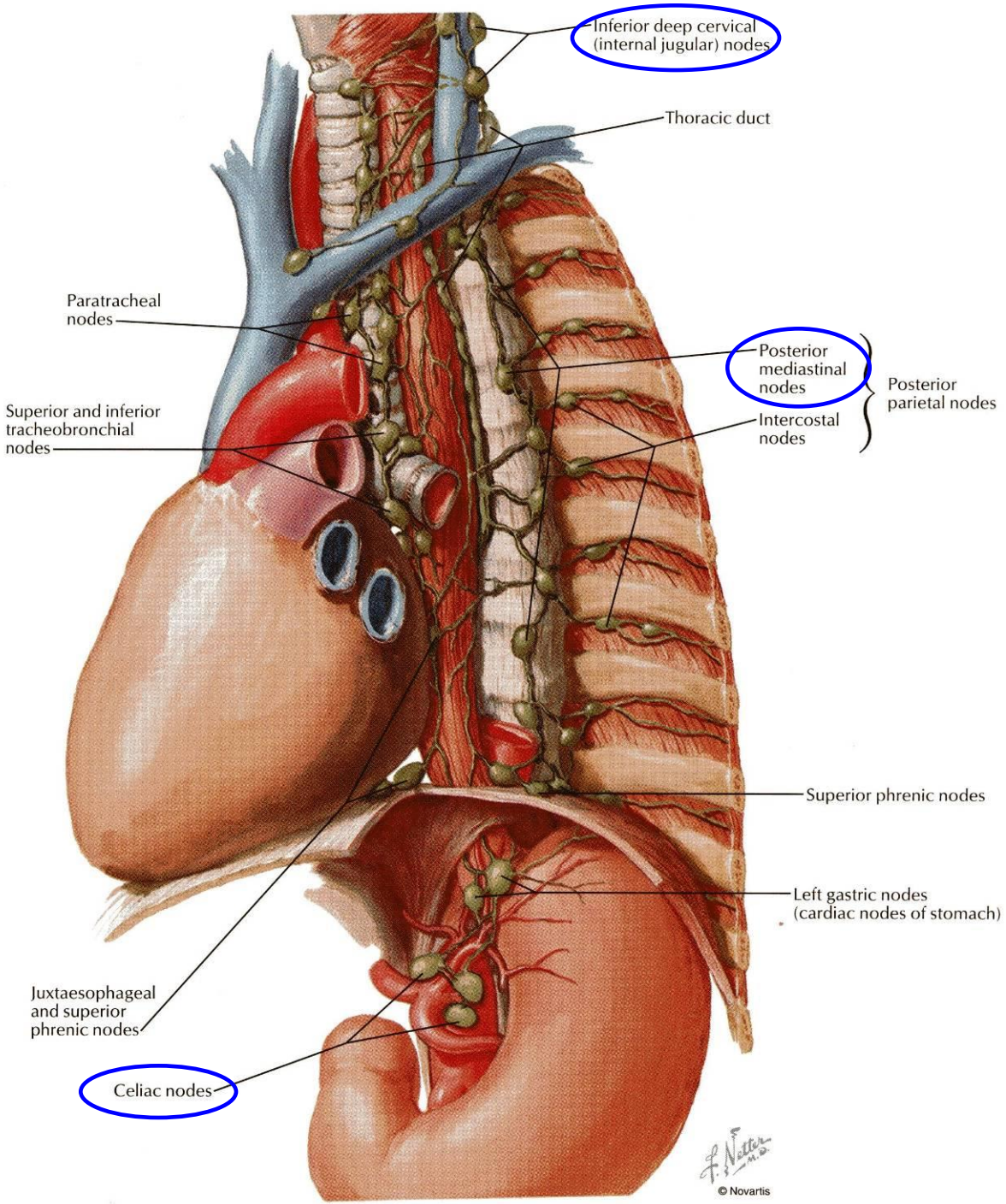
ARTERIAL SUPPLY

- Upper third is supplied by the **inferior thyroid artery**.
- The middle third by the **thoracic aorta**.
- The lower third by the **left gastric artery**.

VENOUS DRAINAGE

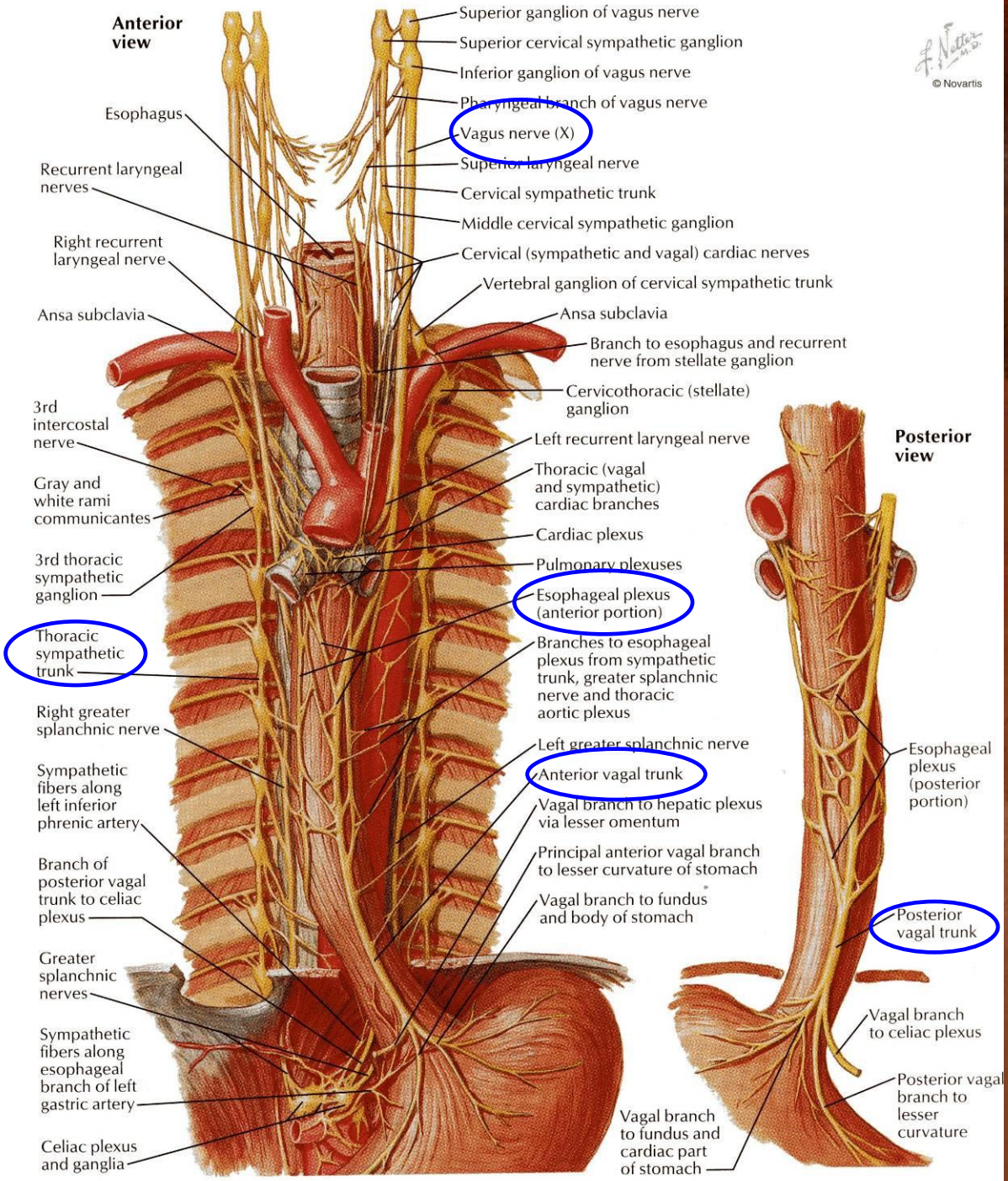


- The upper third drains in into the **inferior thyroid veins**.
- The middle third into the **azygos veins**.
- The lower third into the **left gastric vein**, which is a tributary of the portal vein.



LYMPH DRAINAGE

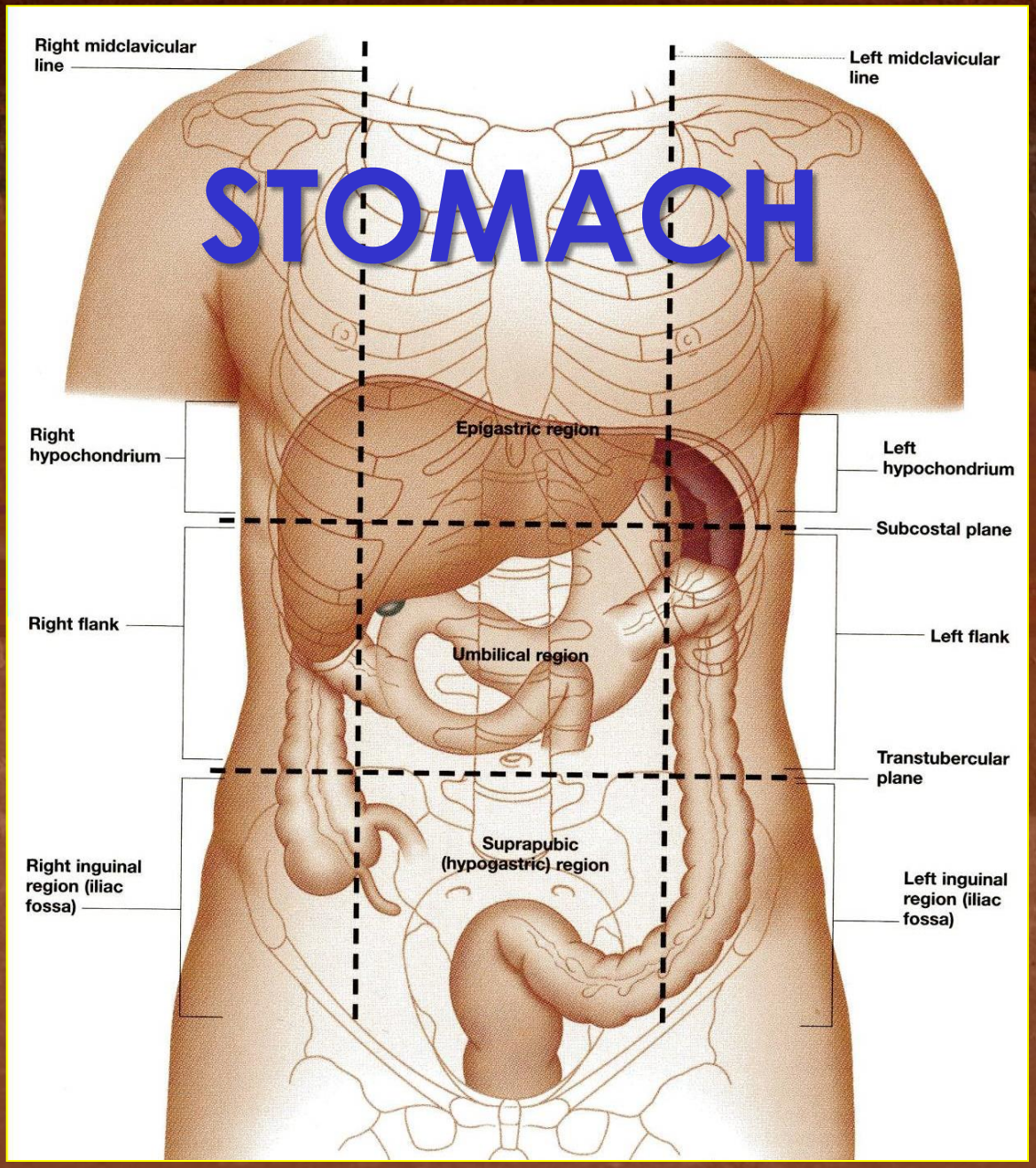
- The upper third is drained in the **deep cervical nodes**.
- The middle third is drained into the **superior** and **inferior mediastinal nodes**.
- The lower third is drained in the **celiac** lymph nodes in the abdomen.



NERVE SUPPLY

- It is supplied by sympathetic fibers from the **sympathetic trunks**.
- The parasympathetic supply comes form the **vagus nerves**.
- Inferior to the roots of the lungs, the vagus nerves join the sympathetic nerves to form the **esophageal plexus**.
- The ***left*** vagus lies **anterior** to the esophagus.
- The ***right*** vagus lies **posterior** to it.

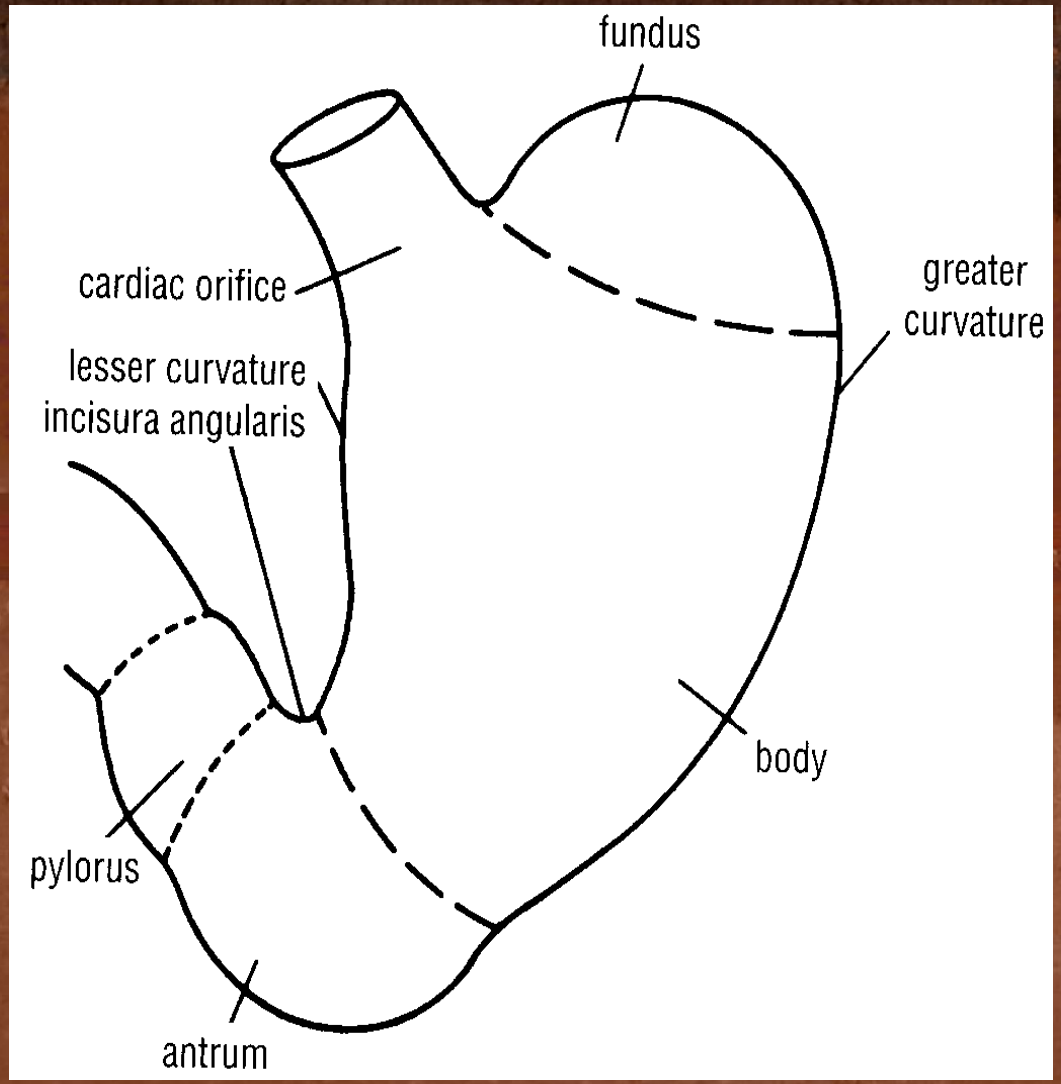
STOMACH



LOCATION

- The stomach is a dilated part of the alimentary canal.
- It is located in the upper part of the abdomen.
- It extends from beneath the left costal region into the epigastric and umbilical regions.
- Much of the stomach is protected by the lower ribs.
- It is roughly **J-** shaped.

PARTS



2 Orifices:
- Cardiac orifice.
- Pyloric orifice.

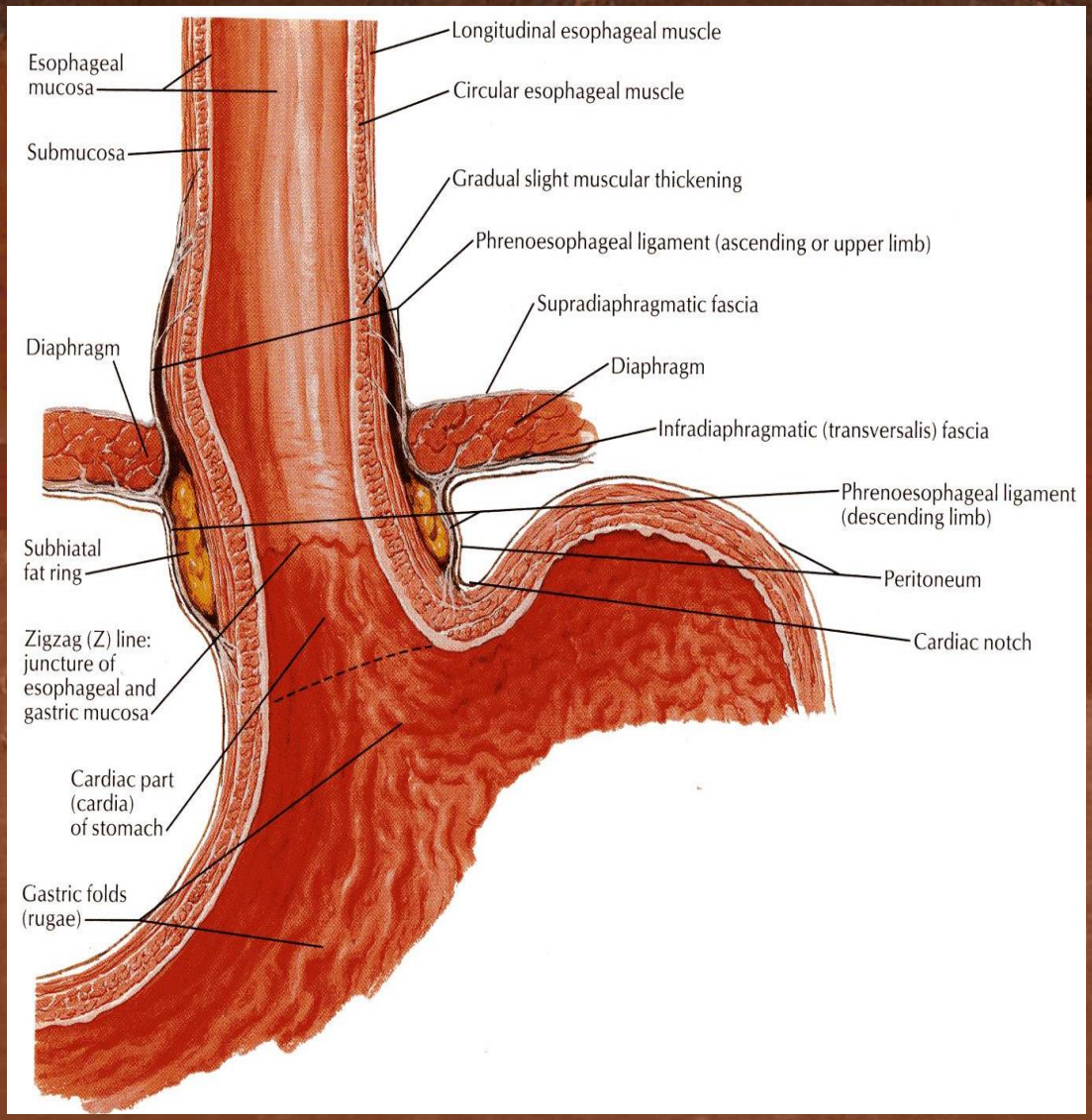
2 Borders:
- Greater curvature.
- Lesser curvature.

2 Surfaces:
- Anterior surface.
- Posterior surface.

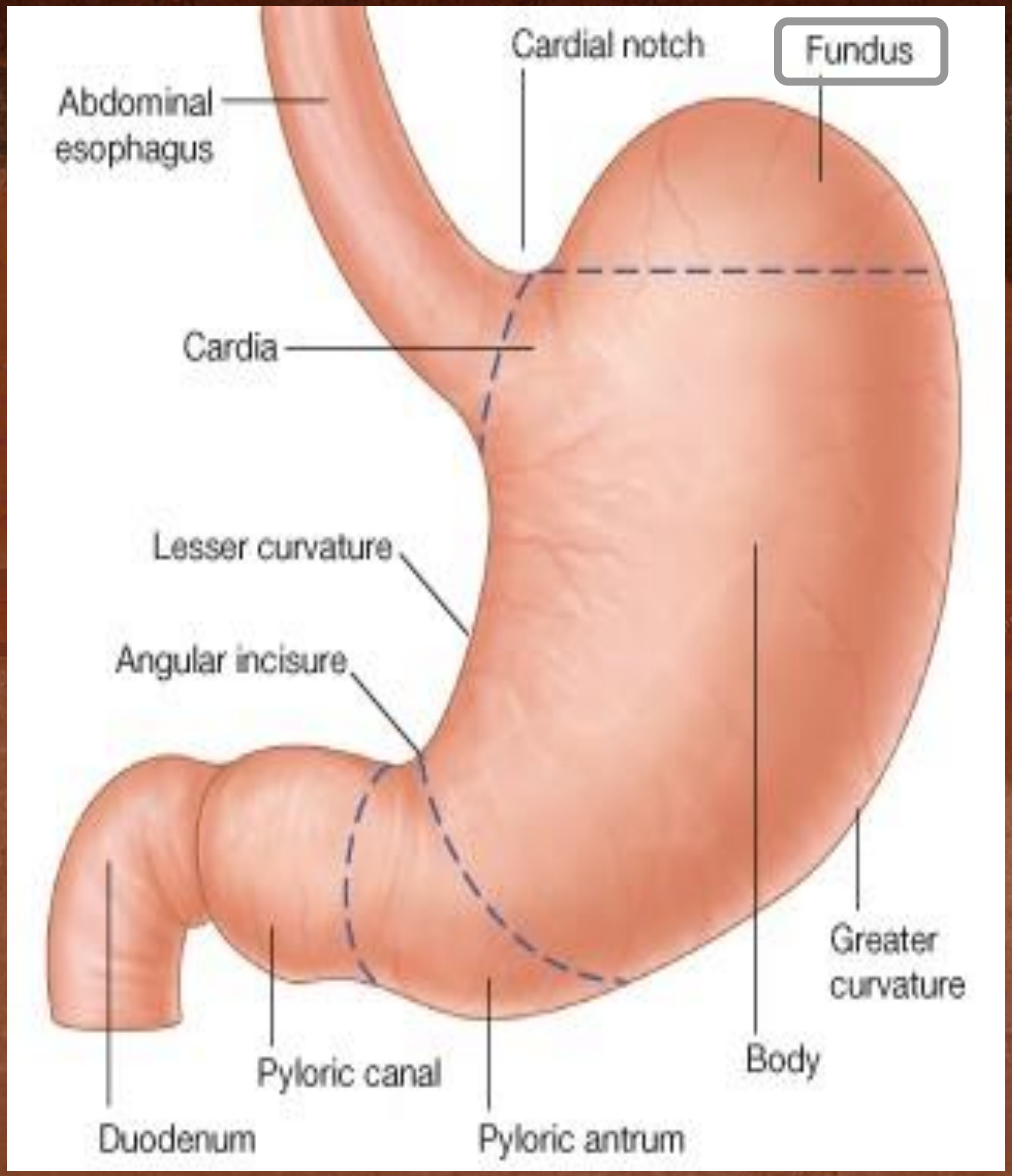
3 Parts:
- Fundus.
- Body.
- Pylorus.

The pylorus is formed of 3 parts:
- Pyloric antrum.
- Pyloric canal.
- Pyloric sphincter.

CARDIAC ORIFICE



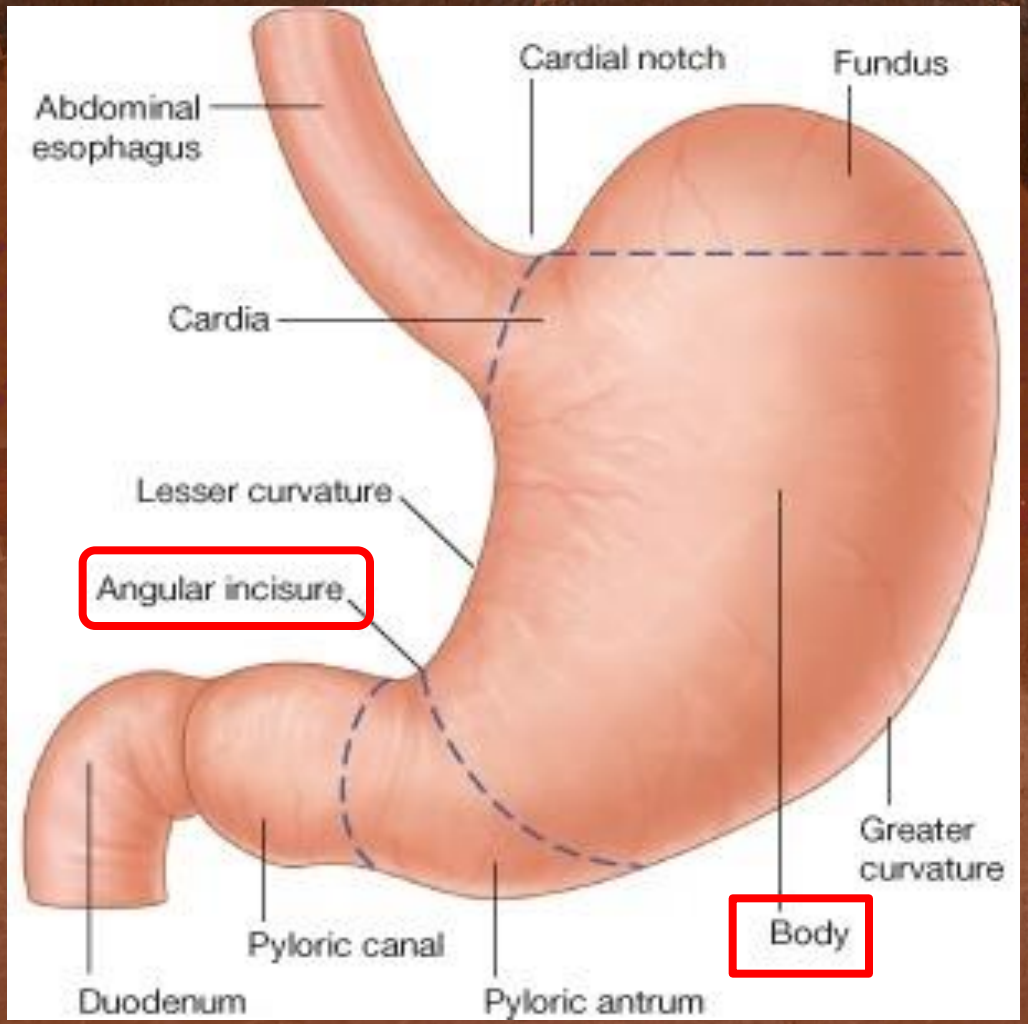
- It is the site of the **gastro- esophageal sphincter.**
- It is a physiological sphincter rather than an anatomical, sphincter.
- Consists of **circular layer** of smooth muscle (under vagal and hormonal control).
- ***Function:***
- Prevents esophageal regurgitation (reflux).



FUNDUS

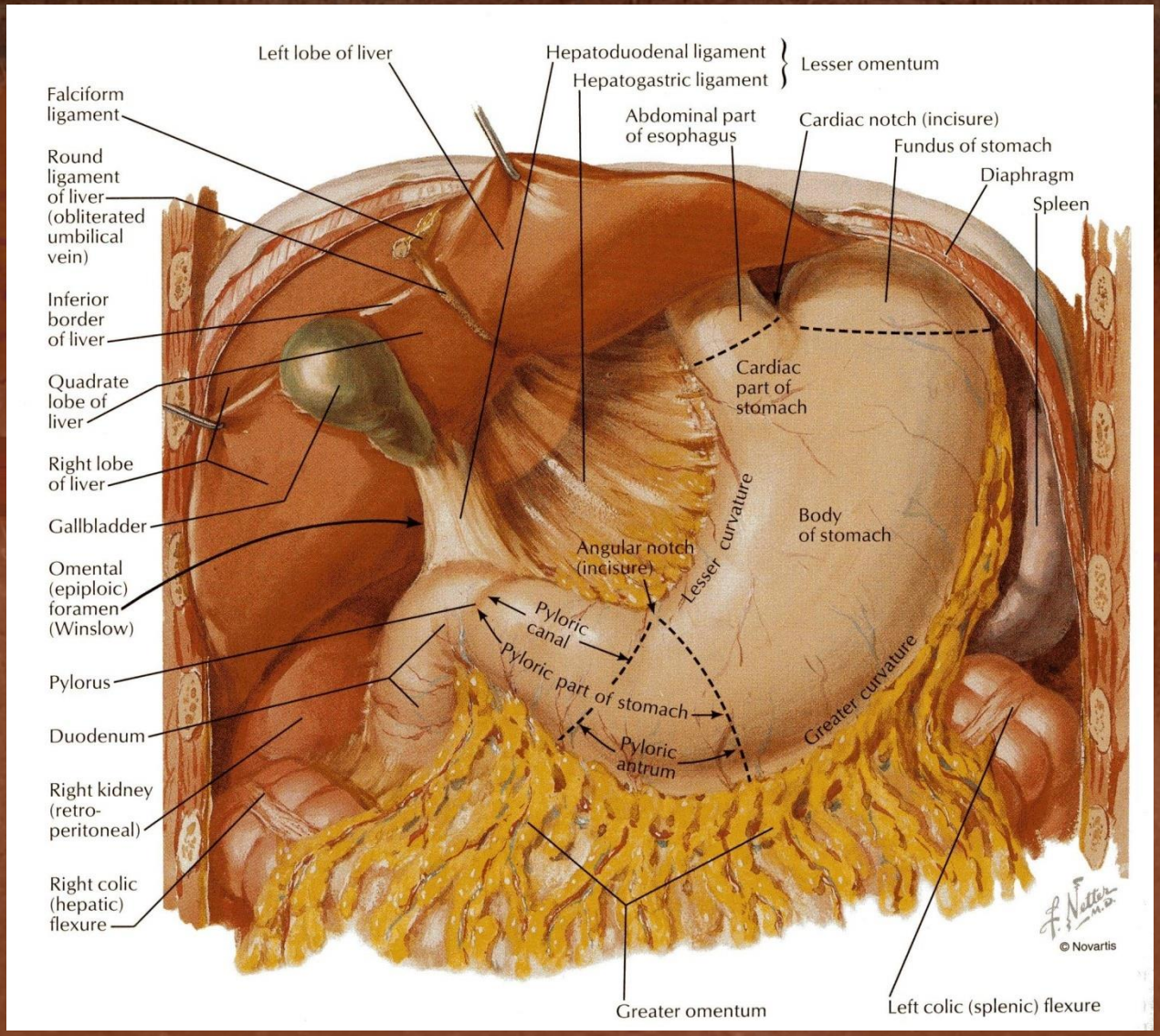
- Dome-shaped.
- Located to the left of the cardiac orifice.
- Usually full of gazes.
- It reaches to the left fifth intercostal space a little below the apex of the heart.

BODY



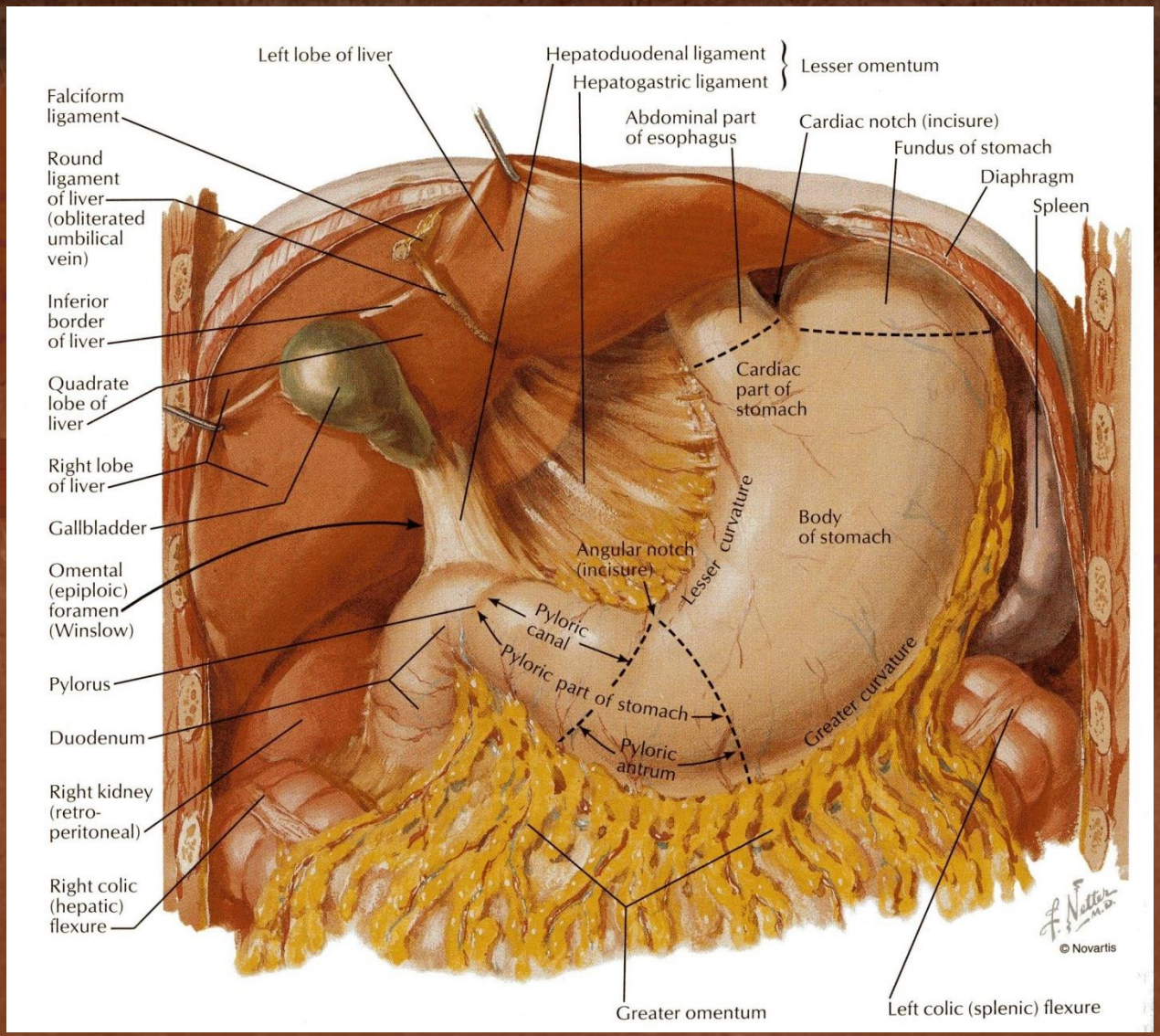
- Extends from:
  - The level of the fundus, to
  - The level of Incisura angularis.
- **Incisura angularis**:
- This is a constant notch on the lesser curvature

LESSER CURVATURE



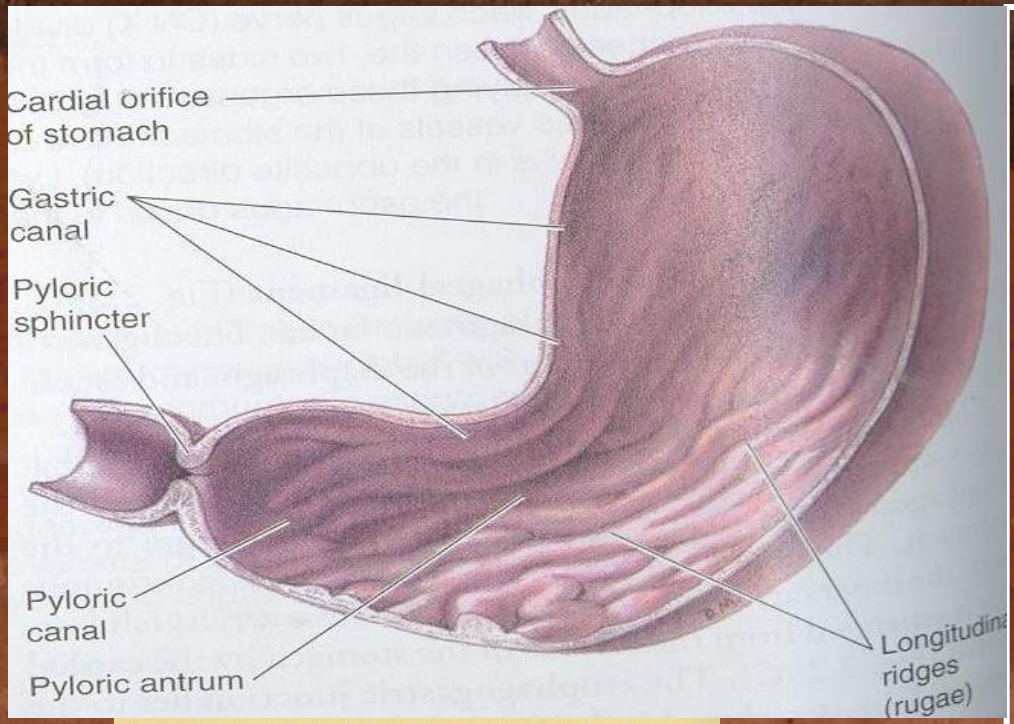
- Forms the right border of the stomach.
- Extends from the cardiac orifice to the pylorus.
- Attached to the liver by the **lesser omentum**, (gasrtohepatic ligament).

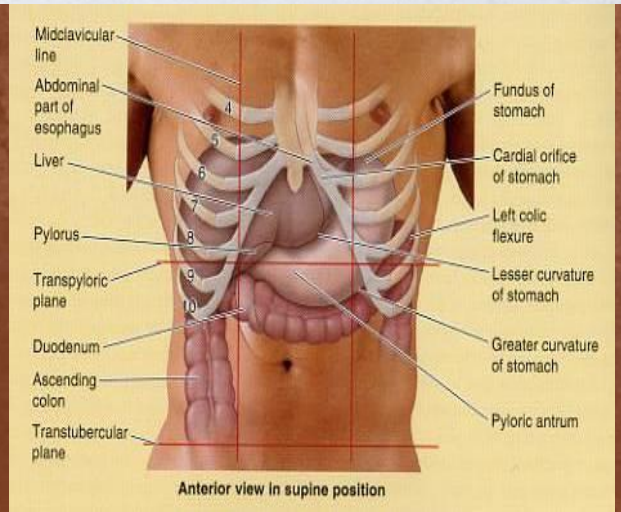
GREATER CURVATURE



- Forms the left border of the stomach.
- Extends from the cardiac orifice to the pylorus.
- Its upper part is attached to the spleen by **gastrosplenic ligament.**
- Its lower part is attached to the transverse colon by the **greater omentum**.

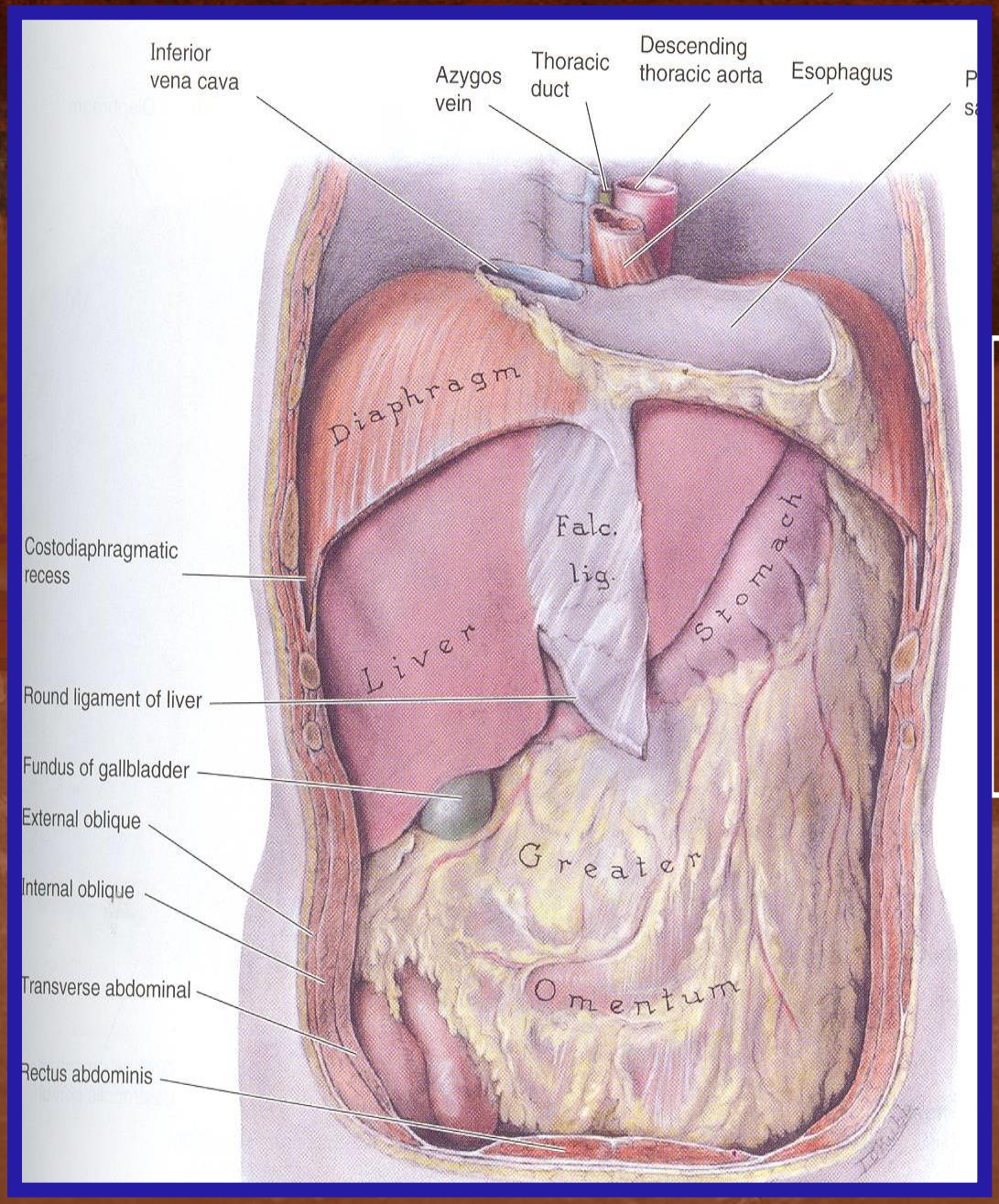
PYLORIC ANTRUM AND PYLORUS





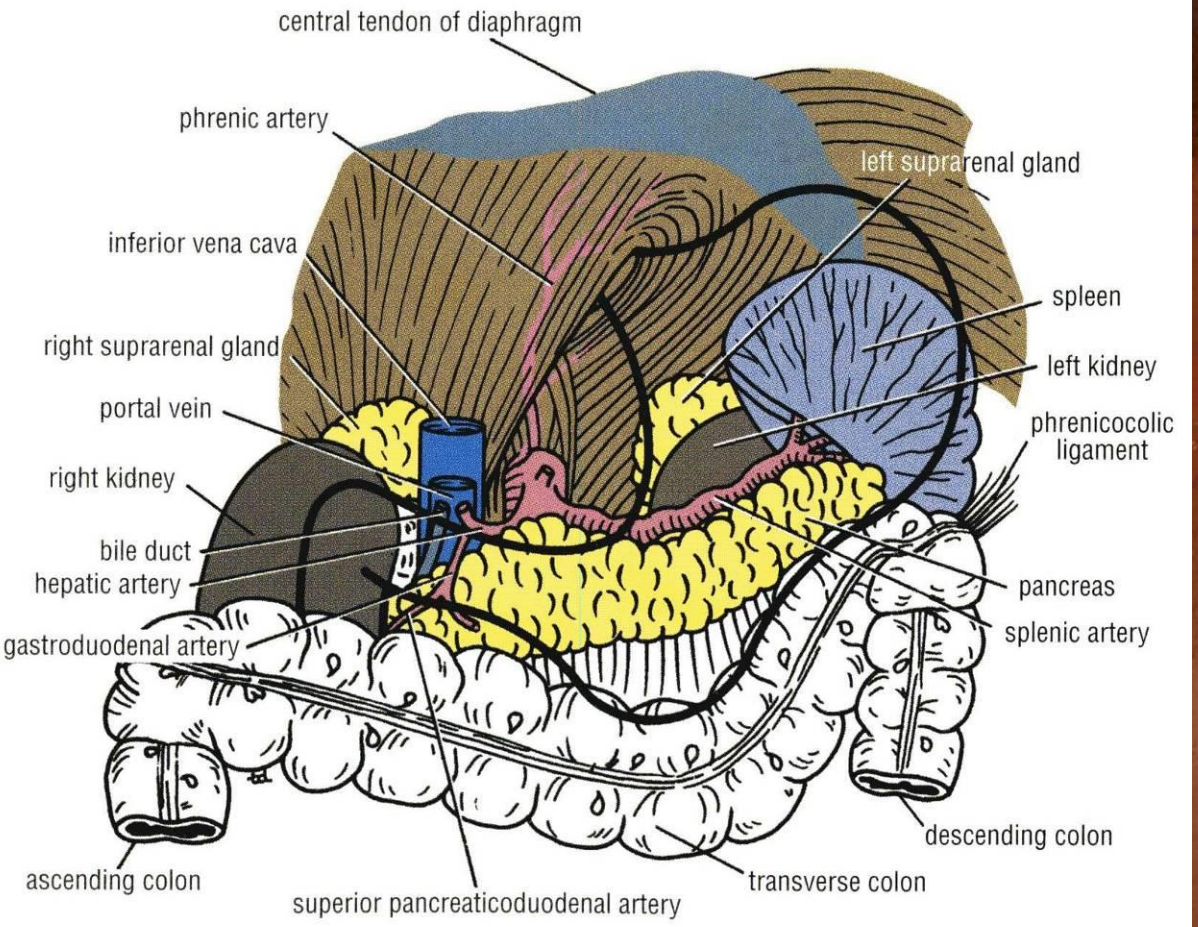
- The **pyloric antrum** extends from Incisura angularis to the pylorus.
- The **pylorus** is a tubular part of the stomach.
- It lies in the **transpyloric plane (L1), 1 cm**. to the right of the middle line.
- It has a thick muscular end called **pyloric sphincter.**
- The cavity of the pylorus is the **pyloric canal**.

ANTERIOR RELATIONS



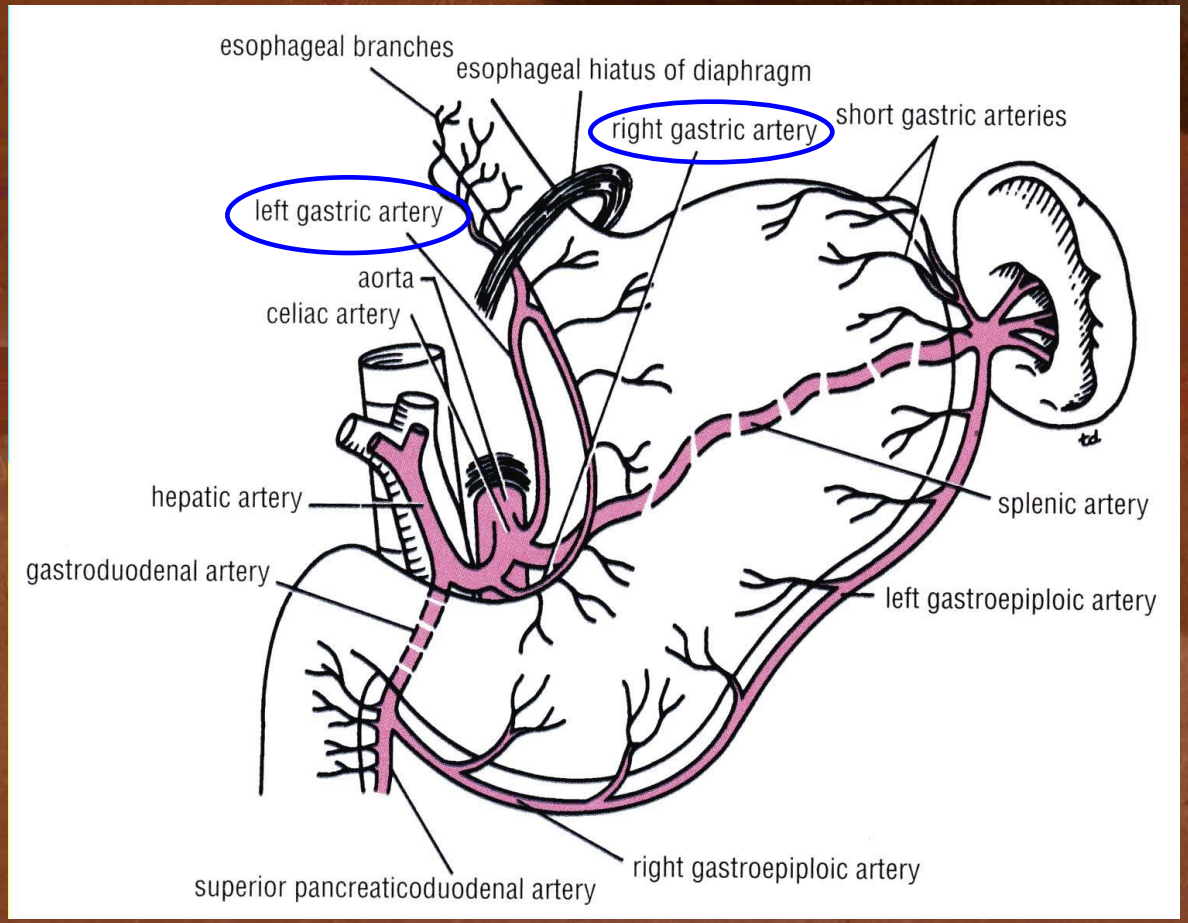
- Anterior abdominal wall.
- Left costal margin.
- Left pleura & lung.
- Diaphragm.
- Left lobe of the liver.

POSTERIOR RELATIONS (Stomach bed)



- Left crus of diaphragm.
- Left suprarenal gland.
- Part of left kidney.
- Spleen.
- Splenic artery.
- Pancreas.
- Transverse mesocolon.
- Transverse colon.
- Lesser sac.
- All these structures form **the stomach bed.**
- All are separated from the stomach by peritoneum of lesser sac except the spleen by greater sac.

ARTERIES

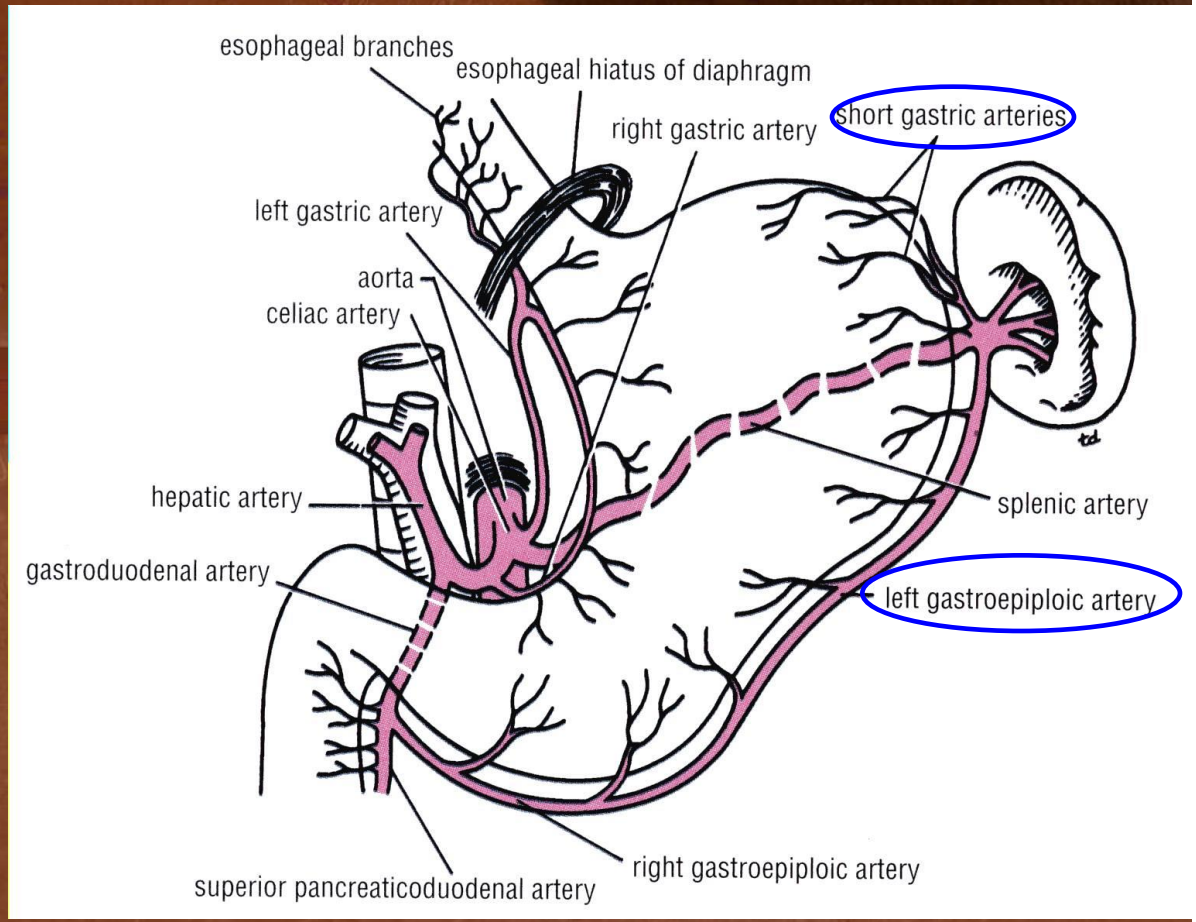


- **5 arteries:**
- 1- Left gastric artery:
- **It is a** branch of celiac artery.
  - Runs along the lesser curvature.
- 2- Right gastric artery:

From the hepatic artery of celiac.

  - Runs to the left along the lesser curvature.

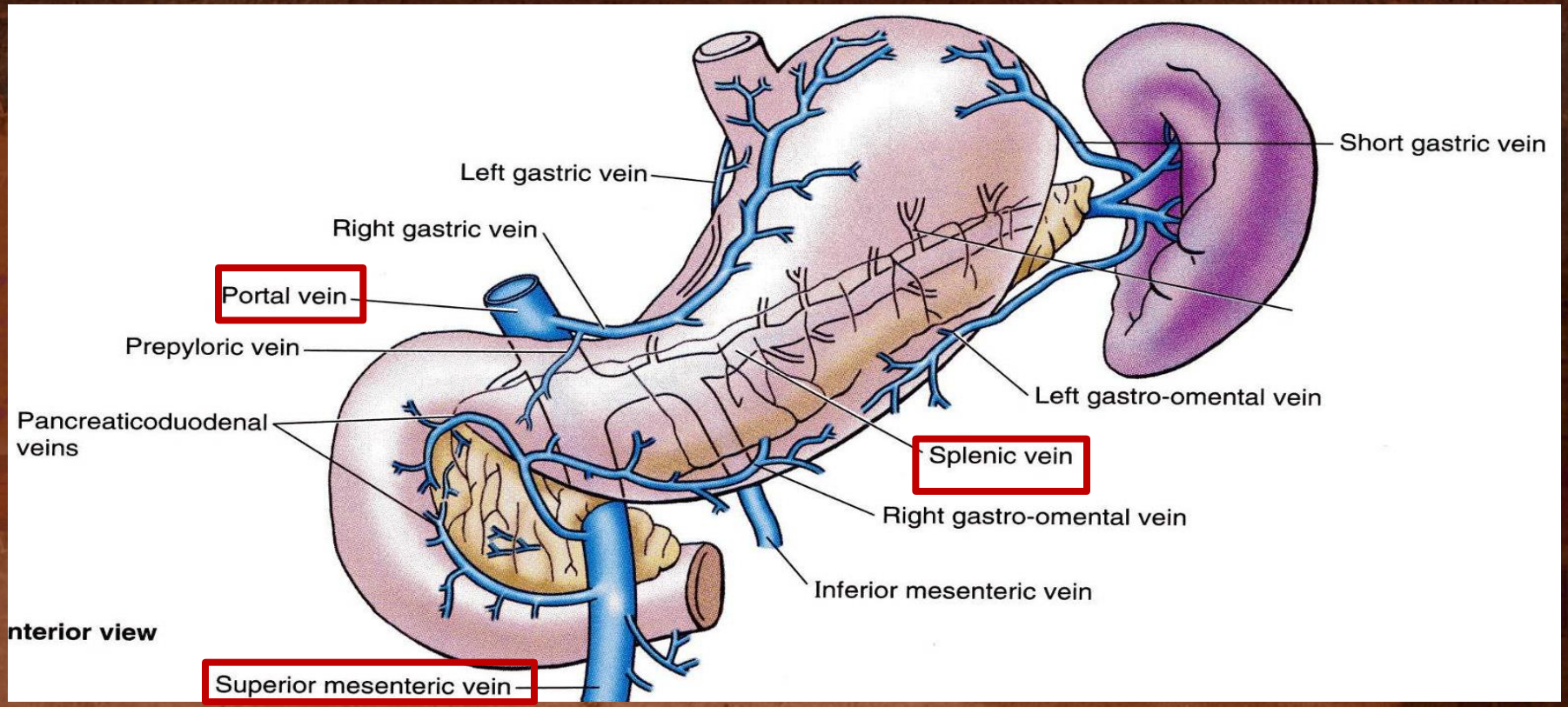
ARTERIES



- 3- Short gastric arteries – arise from the splenic artery.
  - Pass in the **gastrosplenic ligament**.
- 4-Left gastroepiploic artery:

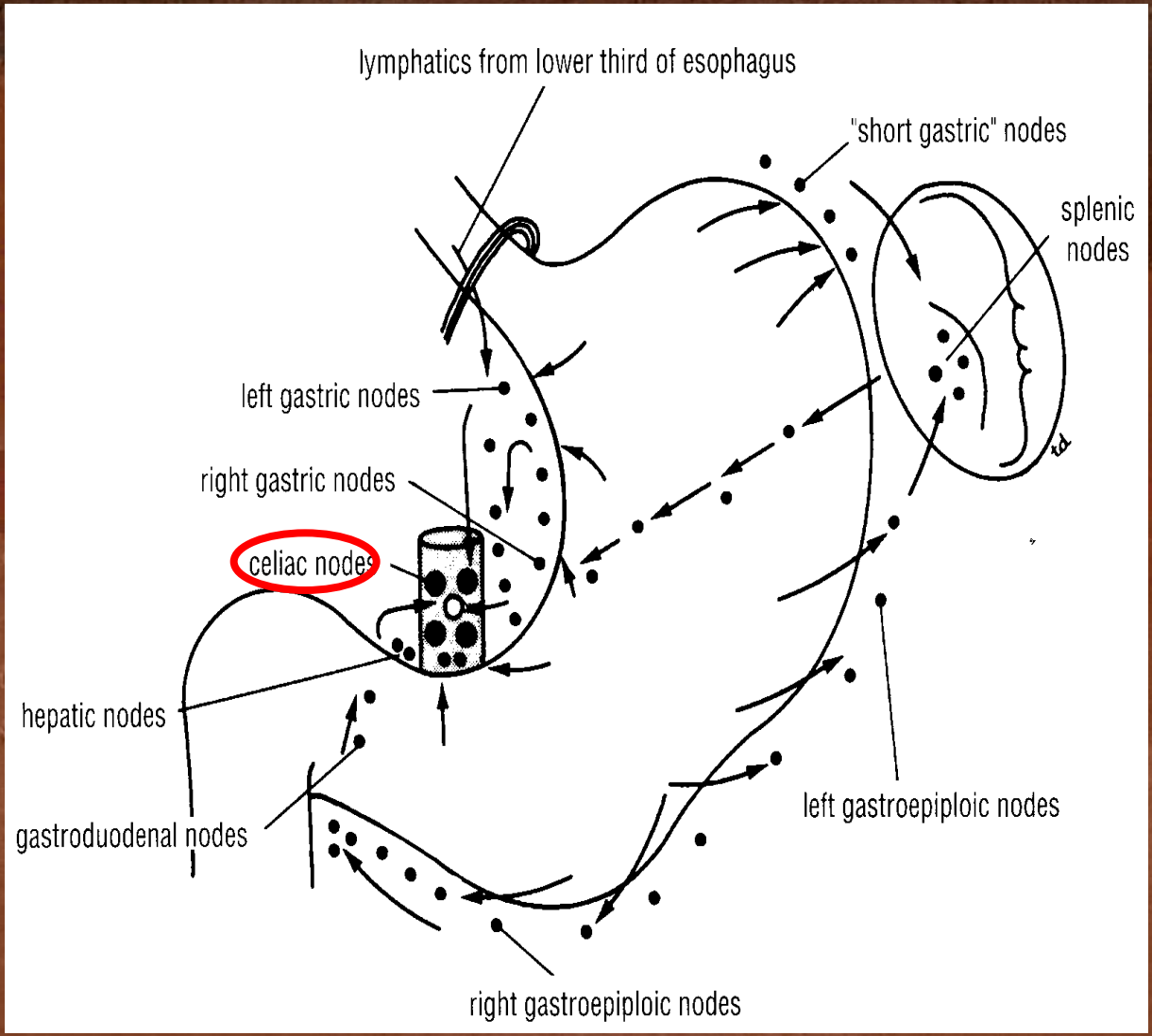
  from splenic artery
  - Pass in the **gastrosplenic ligament**.
- 5- Right gastroepiploic artery:
- from the gastroduodenal artery of hepatic .
  - Passes to the left along the greater curvature.

VEINS

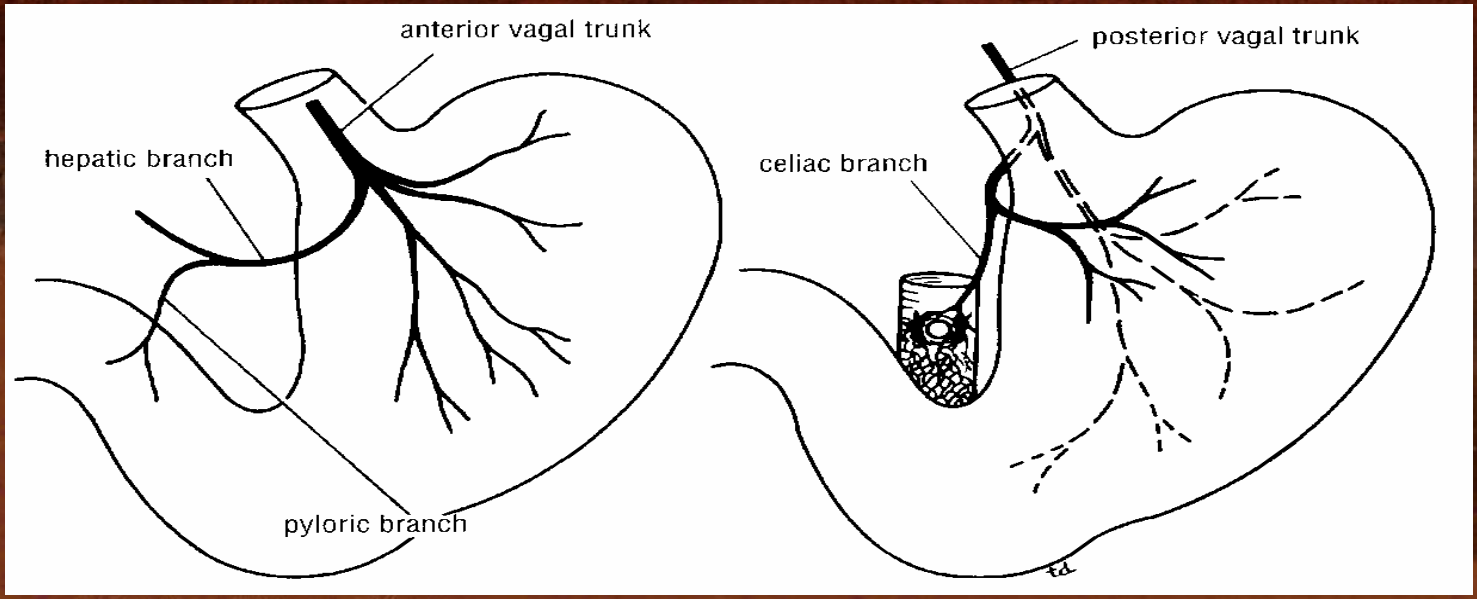


- All of them drain into the **portal circulation**.
- The **right** and **left gastric veins** drain **directly** in the **portal vein**.
- The **short gastric veins** and the **left gastroepiploic vein** join the **splenic vein.**
- The **right gastroepiploic vein** drain in the superior mesenteric vein.

LYMPH DRAINAGE



- The lymph vessels follow the arteries.
- They <u>first</u> drain to the:
  - **Left and right gastric nodes.**
  - **Left and right gastroepiploic nodes** and the
  - **Short gastric nodes.**
- Ultimately, all the lymph from the stomach is collected at the **celiac nodes.**



NERVE SUPPLY

- **Sympathetic fibers** are derived from the **celiac plexus**.
- **Parasympathetic fibers** from **both vagi.**
- **Anterior vagal trunk:**
  - Formed from the **left** vagus
  - Supply the **anterior** surface of the stomach
  - Gives off a **hepatic branch** and from it - a **branch to the pylorus.**
- **Posterior vagal trunk:**
  - Formed from the **right** vagus
  - Supply the **posterior** surface of the stomach
  - Gives off a large branch to the celiac and the superior mesenteric plexuses.

THANK YOU
AND
GOOD LUCK